

Dual Phase System Design Pilot Study Report

**Gasoline Fueling Station – Royal Farms #96
500 Mechanics Valley Road
North East, Cecil County, Maryland 21901**

**OCP Case No. 2011-0729-CE
MDE Facility No. 13326**

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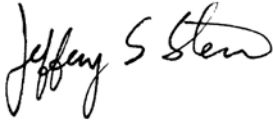
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ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

Dual Phase System Design Pilot Study Report



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1.0 INTRODUCTION

Advantage Environmental Consultants, LLC (AEC) has prepared this Dual Phase System Design Pilot Study Report for the Royal Farms Store No. 96 located at 500 Mechanics Valley Road in North East, Maryland. Site Vicinity, Site Features, and Site Area Maps are provided in Appendix A as Figures 1, 2 and 3.

This report was prepared in accordance with Dual Phase System Design Pilot Study Work Plan, dated October 27, 2011. The work plan was prepared as a companion to the document titled Design Basis Summary - Dual Phase Recovery System, prepared by AEC and dated September 13, 2011.

The Dual Phase System Design Pilot Study Work Plan was approved in correspondence from the Maryland Department of the Environment (MDE) dated December 8, 2011. The MDE required these additional pilot tests to confirm that proposed system modifications outlined in the Design Basis Summary will be capable of achieving the previously established radius of influence (ROI). This report includes estimates of the maximum, minimum, and optimal flow rates needed to establish hydraulic control, with consideration to a phased lowering of the pumps over time to establish optimum recovery of the plume.

1.1 Project Overview

Based on abbreviated enhanced fluid recovery (EFR) pilot studies conducted on July 21 and 22, 2011 a Corrective Action Plan (CAP) was prepared and submitted to the MDE on July 25, 2011. The CAP presented the following remediation system design criteria: ROI - 20 feet; individual recovery well flow rate – 3.2 gallons per minute (gpm); individual recovery well drawdown – up to 5 feet below static groundwater; and, individual recovery well air flow rate - 50 cubic feet per minute (cfm). Data collected during the course of the initial pilot study did not provide some necessary final design parameters associated with the feasibility of the technology and process/treatment equipment sizing. As such, the performance of a full scale EFR pilot study was recommended in the CAP.

Based on the full scale EFR pilot study conducted on July 27, 2011, using equipment enabling the necessary design data to be collected, a CAP Addendum (August 3, 2011) was developed. The full scale EFR pilot study indicated the following remediation system design criteria: ROI - 25 feet; individual recovery well flow rate – 4 to 6 gpm; individual recovery well drawdown - 4 feet below static groundwater; and, individual recovery well air flow rate - 50 cfm.

Both the CAP and the CAP Addendum planned on an EFR design using liquid ring pump (LRP) technology. The CAP and CAP Addendum selected the LRP technology based on extraction at eight recovery wells. Based on a technical meeting with the MDE, an expansion of the recovery system to a range of 10 to 13 wells was required. As a result of the increased system flow rates from the additional wells, the standard LRP equipment would be reaching its maximum design capabilities. As such, a Design Basis Summary was created that introduced the dual phase approach using integrated

vapor extraction/groundwater extraction (VE/GE) technology. The VE/GE will be implemented using pneumatic submersible pumps for liquid removal and a positive displacement vacuum blower for vapor removal. This technology is similar to LRP induced EFR but offers the capability for increased flow rates.

1.2 Project Objectives

The primary objective of the dual phase system design pilot studies is to confirm that the proposed system modifications outlined in the Design Basis Summary are capable of achieving the previously established ROI (25 feet). In order to accomplish this task the following studies were performed: constant rate aquifer pumping test and modified step drawdown and dual phase recovery tests. A brief description of the pilot study activities is presented below.

A constant-rate aquifer pumping test was conducted at select recovery and monitoring wells to estimate aquifer parameters (hydraulic conductivity and coefficient of transmissivity) and the effective radius of influence (capture zone) of each well under a constant pumping rate. Recovery measurements were also obtained for similar time intervals as the drawdown measurements.

The modified step drawdown test entailed pumping the recovery well at successively higher flow rates for equal, or nearly equal, time steps. The step drawdown testing was used to evaluate an optimal flow rate for the dual phase recovery test discussed below. Using the results of the step drawdown testing, a specific flow rate was used for the dual phase recovery test. The dual phase recovery test was used to determine if equivalent water and air flows as the design basis summary (4 to 6 gpm water flow and 50 cfm air flow) produce a similar radius of influence as the recent EFR test.

2.0 PILOT STUDY PROCEDURES

2.1 Pilot Study Location Selection

The location of the pilot study is on the northeast quadrant of the Site. This area has been characterized by multiple temporary piezometers, monitoring and recovery wells. This area is located within the Liquid Phase Hydrocarbon (LPH) plume and adjacent to the suspect source area (northeastern dispenser islands). Figure 4 in Appendix A illustrates the historical extent of LPH.

2.2 Pilot Study 1 – Constant Rate Pumping Test

The following is the operating procedure for the aquifer pumping test conducted at the Site on January 13, 2012. The pilot study used extraction equipment that was capable of producing approximately equivalent water flows as the design basis summary description (i.e., 4 to 6 gpm). The pilot study groundwater extraction pump was capable of up to 10 gpm flows.

2.2.1 Procedure

The constant rate test is the standard method for determining the aquifer parameters of hydraulic conductivity and transmissivity. The resultant drawdown data was plotted verses time and distance to develop these aquifer parameters. RW-13 was used as the recovery well. Water levels in monitoring wells RW-2, RW-4, RW-6, RW-7 and RW-10 were recorded using pressure transducers. Water levels in wells RW-1, RW-3, MW-5, and MW-6 were recorded using a water level meter. Based on the previous EFR pilot study it was expected that equilibrium conditions could be reached in approximately 4 hours. The constant rate pumping test was performed for a period of 4 hours and 38 minutes.

The following procedures were used to perform the pumping test:

- An initial round of water levels was collected within each monitoring well using an oil-water interface probe accurate to 0.01-feet.
- The beginning of data collection was programmed to begin several minutes before the start of the test. The transducers were programmed to use drawdown mode relative to the static water level and to obtain 30-second arithmetic data during the pumping and recovery tests. The transducers installed in the monitoring wells were programmed to obtain 30-second arithmetic data during the pumping test. In order to obtain more frequent initial data the transducer in the recovery well was programmed to collect logarithmic data.
- The pressure transducers were installed in the recovery well and select monitoring wells and the elevation of each transducer recorded. The pressure transducer data logger data was verified throughout the test with manual (tape) water-level measurements.

- A pneumatic pump (QED pneumatic AP-4 Auto Pump) was installed in the recovery well. The pump intake was set at approximately 5 feet below static water levels.
- An initial test was performed in order to determine optimal flow rate. The flow rate was verified with a 5-gallon bucket and stopwatch. The flow rate was controlled using a valve on the pump setup.
- Flow rate measurements were performed as accurately and timely as necessary to allow a constant flow rate to be maintained during the course of the test. The flow rate was verified using a five-gallon bucket and stopwatch.
- The fluids were piped to a 275-gallon poly tank. During the study the evacuated water was removed from the holding tank via a vac-truck and appropriately disposed of as hydrocarbon-impacted liquids.

2.2.2 Recovery Phase

Transducers installed in monitoring wells were programmed to obtain 30-second arithmetic data during the recovery test. The transducer installed in the recovery well was programmed to obtain logarithmic data in order to obtain more frequent initial data.

2.3 Pilot Study 2 – Modified Step Drawdown and Dual Phase Recovery Tests

The following is the operating procedure for a modified step drawdown and dual phase recovery tests conducted at the Site on January 12 and 16, 2012, respectively.

2.3.1 Procedure for Modified Step Drawdown Test

The procedure entailed pumping and vacuuming the test well at successively higher water flow rates for equal, or nearly equal, time steps. The flow rate in gpm and pumping well drawdown was recorded at the end of each step. Increases in flow rate were evenly spaced (i.e., 2, 3, 4 gpm). The pilot study was conducted in steps of 90 minutes (Step 1), 90 minutes (Step 2) and 98 minutes (Step 3) for a total of 278 minutes. RW-13 was used as the recovery well. Water levels in wells RW-2, RW-4, RW-6, RW-7 and RW-10 were recorded using pressure transducers. The same procedures were used above along with the procedures outlined below.

- The recovery well head was fitted with a 4-inch diameter PVC riser. The pressure transducer cable, pump air supply hose and pump discharge hose were installed through a well sanitary seal placed on top of the riser. The 2-inch diameter VE piping was connected to the riser using a PVC tee below the sanitary seal. The vacuum source (Rietschle VLR 250 Vacuum Pump, 7.5 HP) was fitted with an ambient relief valve and a flow control valve.
- Vacuum readings were measured in the observation and recovery wells. The vacuum readings were collected using magnehelic differential vacuum gauges attached to the well heads. Air-flow rates and air quality were measured at the effluent stack using a hot wire anemometer and photo-ionization device (PID), respectively. Measurements occurred at an approximate frequency of one every five minutes for the first thirty minutes of the pilot study. Measurements were collected less frequently as the pilot study progressed. AEC

noted the total volume of liquid extracted and the average recovery rate during the pilot study.

2.3.2 Procedure for Dual Phase Recovery Test

Using the results of the step drawdown test, a flow rate of 3 gpm was used for the dual phase recovery test. This test was conducted for a period of 404 minutes. The recovery well was RW-13. Water and vacuum levels in wells RW-2, RW-4, RW-6, RW-7 and RW-10 were recorded using pressure transducers and differential pressure gauges. Water and vacuum levels in wells MW-6, RW-1 and RW-11 were recorded using a water level meter and differential pressure gauges. The same procedures used in the modified step drawdown task were used for this study.

2.4 Waste Management Procedures

The hydrocarbon impacted water and LPH encountered during testing activities was collected and containerized in a vacuum truck. The contained fluids were properly characterized and transported off-site for final disposal or treatment at facility permitted to accept impacted water originating from the State of Maryland. AEC retained copies of all manifests and receipts that were signed prior to transport. Copies of these documents are included in Appendix B.

3.0 PILOT STUDY RESULTS

3.1 Pilot Study 1 – Constant Rate Pumping Test

The data obtained from the constant rate pumping test was analyzed using the aquifer testing program AQTESOLV for Windows, v4.50. The methods included Cooper-Jacob (1946) and Theis (1935). The recovery phase data was analyzed using Theis (1935).

Drawdown Analysis

As shown on Graphs 1 and 2 included in Appendix C, during pumping of RW-13, water elevations in observation wells RW-4, RW-6, RW-7 and RW-10 decreased below static water levels. An initial decrease in water elevation was also observed in RW-2; however, an increase in water level began at this location approximately 38 minutes into the test. The majority of the drawdown occurred within 50 minutes of the start of the test. This data is presented in Table 1 in Appendix D. A summary of drawdown observations is presented in the following table.

Constant Rate Pumping Test

Pilot Study Data Summary

Royal Farms 96-500 Mechanics Valley Road, North East, Maryland

Monitoring Well	Distance From Pumping Well (ft.)	Drawdown at Completion of Test (ft.)
RW-13 (Pumping Well)	0	6.41
RW-4	21	0.27
RW-7	21	0.28
RW-6	23	0.18
RW-2	27	0.09*
RW-10	28	0.27

*Maximum drawdown for MW-2 was observed approximately 38 minutes after the start of the constant rate pumping test.

Analysis of pumping test data using the Cooper-Jacob (1946) and Theis (1935) methods resulted in K values of 0.001 feet/second (ft/sec). Based on the observed drawdown in RW-10, located approximately 28 feet from the pumping well, the radius of influence is at least 28 feet for the extraction well RW-13 operating with a discharge rate of 1 gpm. A groundwater gradient map and cross sections of the drawdown illustrating the effects of the pumping test are included as Figures 5 and 6 in Appendix A. A distance versus drawdown plot (Graph 3) is provided in Appendix C.

Recovery Analysis

Logarithmic groundwater level recovery measurements were collected at RW-13 immediately following the completion of the pumping test. Recovery data was also collected from RW-2, RW-4, RW-6, RW-7 and RW-10 at 30-second intervals. The groundwater level in RW-13 returned to 98 percent of the static water level within 12 minutes of the pumping test completion. This may have been partially influenced by the

release of water from the pump and/or hose into the well. The data obtained from the RW-13 recovery testing was analyzed using the aquifer testing program AQTESOLV for Windows, v4.50. Theis (1935) was the selected analysis method. The AQTESOLV output showed that the hydraulic conductivity at RW-13 is 0.004 ft/sec. A summary of aquifer parameters developed during the various testing efforts is presented below.

**Constant Rate Pumping Test
 Pilot Study Data Summary
 Royal Farms 96-500 Mechanics Valley Road, North East, Maryland**

Analysis Method	K (ft/min)	Transmissivity (ft² / sec)	V (ft/ day)
Theis – Pumping	0.07	0.01	11.36
Theis - Recovery	0.24	0.04	
Cooper-Jacob - Pumping	0.06	0.01	
Average	0.12	0.02	
Average w/o Recovery	0.06	0.01	0.288

The average hydraulic conductivity using all three methods is 0.12 ft/min. The average hydraulic conductivity using just the pumping methods is 0.06 ft/min. The average hydraulic conductivity value range is consistent with the encountered lithology (i.e. sand) as compared to ranges of hydraulic conductivity values in the literature (Freeze and Cherry, 1979). Data generated as part of the AQTESOLV analysis is presented in Appendix E.

Based on the results of the pumping and recovery tests, the groundwater flow velocity is estimated to be 0.288 feet/day. Flow velocity was computed using Darcy’s law, which is described as: $V = K(dh/dl)/n$. K is the hydraulic conductivity (86.4 ft/day), dh/dl is the groundwater gradient between RW-6 and RW-1 on January 13, 2012 (0.001 feet per foot); n is the effective porosity (30 percent). The porosity value (sand) was estimated from the literature (Freeze and Cherry, 1979).

A capture zone consists of the up-gradient and down-gradient areas that will drain into a pumping well. The dimensions of the capture zone from a pumping well in a homogeneous water-bearing unit with a fully penetrating pumping well are a function of the water-bearing unit thickness, discharge rate, and flow velocity. The only values that require calculation are the width of inflow zone and the distance to the stagnation point, which is located down-gradient of the pumping well.

The distance to the stagnation point is derived by equating the flow velocity under static groundwater conditions to the velocity of groundwater moving toward the pumping well. The width of the inflow zone, up-gradient of the pumping well, is an estimate of the maximum width of the groundwater capture zone. Using capture zone equations as shown on the work sheet presented in Appendix E, the distance to stagnation point and width of the inflow zone were determined to be 10.6 feet and 66.6 feet, respectively. These dimensions are consistent with the pumping conditions gradient map (Figure 5) with respect to the general size of the ROI on the map and the estimated capture zone.

3.2 Pilot Study 2 – Modified Step Drawdown and Dual Phase Recovery Tests

3.2.1 Modified Step Drawdown Test

The purpose of the modified step drawdown test was to determine an optimal flow rate for the dual phase recovery test. As shown on Graphs 4 and 5 included in Appendix C, during pumping of RW-13, water elevations in observation wells RW-2, RW-4, RW-6, RW-7 and RW-10 decreased below static water levels. The majority of the drawdown occurred within 50 minutes of the start of the test (during step 1) at a flow rate of 2 gpm. A slight drawdown trend was observed during step 2 at a flow rate of 3 gpm. Water levels were generally stable for step 3 at a flow rate of 4 gpm. This data is presented in Table 2 in Appendix D. Observed drawdown for each of the observation wells is summarized in the following table.

**Modified Step Drawdown Test – Summary of Drawdown Response
 Pilot Study Data Summary
 Royal Farms 96-500 Mechanics Valley Road, North East, Maryland**

Monitoring Well	Distance From Pumping Well	Drawdown at Completion of Step 1 (2 gpm)	Drawdown at Completion of Step 2 (3 gpm)	Drawdown at Completion of Step 3 (4 gpm)
RW-13 (Pumping Well)	0	*	*	*
RW-4	21	0.36	0.45	0.42
RW-7	21	0.40	0.50	0.49
RW-6	23	0.32	0.41	0.38
RW-2	27	0.34	0.43	0.43
RW-10	28	0.41	0.52	0.53

*Adequate drawdown measurements in RW-13 were not collected during this test due to water turbulence caused by the vacuum pump. All measurements in feet.

During the RW-13 pilot study the following wells were monitored for vacuum: RW-2, RW-4, RW-6, RW-7 and RW-10. The vacuum readings were collected using magnehelic differential vacuum gauges attached to the well heads. Vacuum pump vapor discharge stack effluent air flow and quality were measured using a Dwyer Series 470 Thermal Anemometer and a MiniRAE 2000 portable PID. Groundwater flow was estimated for each step using a five-gallon bucket and stop watch.

The modified step drawdown test was conducted with a vacuum of 129-inch H₂O (approximately 9.5-inch Hg) applied to extraction well RW-13. The initial vacuum applied to the well remained stable throughout the duration of the study. Vacuum influence readings were recorded at regular intervals from the vacuum monitoring points throughout the study.

Field observations indicated that the vacuum influences in the monitoring wells generally stabilized approximately 32 minutes after step 1 began and remained stable through the completion of step 2 (146 minutes). In general, the highest average vacuum readings were observed during step 2 at a flow rate of 3 gpm. Recorded vacuum influence occurred in all

of the monitored wells. The vacuum readings were similar in RW-6 and RW-7 located 23 and 21 feet from RW-13, respectively. Vacuum influence versus distance for the modified step drawdown test is presented in Graphs 6, 7 and 8 in Appendix C. As the graphs illustrate, an effective vacuum influence of 0.1-inch H₂O may be expected at a distance of approximately 25 feet from the recovery wells with 129-inch H₂O vacuum applied. This data is presented in Table 3 and 4 in Appendix D. A summary of vacuum observations is presented in the following table.

**Modified Step Drawdown Test – Summary of Vacuum Response
 Pilot Study Data Summary
 Royal Farms 96-500 Mechanics Valley Road, North East, Maryland**

Step	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
Average (Step 1)	129	1.29	2.43	2.34	0.73	0.04
Average (Step 2)	129	1.65	2.81	2.83	0.73	0.10
Average (Step 3)	129	1.66	2.69	2.43	0.71	0.11
Distance from RW-13	0	21	21	23	27	28

All measurements in inches H₂O.

PID readings from the vacuum pump vapor stack ranged from 49 to 509 parts per million (ppm) and showed a stable trend in concentration as the study progressed. Air flow readings from the vacuum pump vapor stack averaged 35 cfm and showed a stable trend in flow rate as the study progressed.

3.2.2 Dual Phase Recovery Test

As shown on Graphs 9 and 10 included in Appendix C, during the dual phase recovery test of RW-13, water elevations in observation wells RW-4, RW-6, RW-7, and RW-10 decreased below static water levels. An initial decrease in water elevation was also observed in RW-2; however, an increase in water level began at this location approximately 32 minutes into the test. The majority of the drawdown occurred within 50 minutes of the start of the test. This data is presented in Table 5 in Appendix D. A summary of drawdown observations is presented in the following table.

**Dual Phase Recovery Test – Summary of Drawdown Responses
 Pilot Study Data Summary
 Royal Farms 96-500 Mechanics Valley Road, North East, Maryland**

Monitoring Well	Distance From Pumping Well	Drawdown at Completion of Test
RW-13 (Pumping Well)	0	*
RW-4	21	0.44
RW-7	21	0.52
RW-6	23	0.43
RW-2	27	0.13**/+1.34
RW-10	28	0.66

* Drawdown measurements in RW-13 not collected during test due to turbulence caused by blower. **Maximum drawdown in MW-2 at 32 min.

During the RW-13 dual phase recovery test, the following wells were monitored for vacuum: RW-2, RW-4, RW-6, RW-7 and RW-10. The vacuum readings were collected using magnehelic differential vacuum gauges attached to the well heads. Vacuum pump vapor discharge stack effluent air flow and quality were measured using the same equipment referenced above. Groundwater flow was estimated for each step using by gauging with a five-gallon bucket and stop watch.

The dual phase recovery test was initiated with a vacuum of 129-inch H₂O (approximately 9.5-inch Hg) applied to extraction well RW-13. The initial vacuum applied to the well remained stable throughout the duration of the study. Vacuum influence readings were recorded at regular intervals from the vacuum monitoring points throughout the study.

Field observations indicated that the vacuum influences in the observation wells generally stabilized approximately 20 minutes after the start of the dual phase recovery test. The highest average vacuum readings were observed in RW-7 located 27 feet from RW-13. Recorded vacuum influence occurred in all of the monitored wells. This vacuum response is consistent with the findings of the previous EFR pilot study. Vacuum influence versus distance for the dual phase recovery test is plotted in Graph 11 (Appendix C). As the graph demonstrates, an effective vacuum influence of 0.1-inch H₂O may be expected at a distance of approximately 25 feet from the recovery wells. An applied vacuum gradient map illustrating vacuum data collected at the end of the dual phase extraction test is included as Figure 8 (Appendix A). This data is presented in Tables 6 and 7 (Appendix D). A summary of vacuum observations is presented in the following table.

**Dual Phase Recovery Test - Summary of Vacuum Response
 Pilot Study Data Summary
 Royal Farms 96-500 Mechanics Valley Road, North East, Maryland**

	RW-13	RW-2	RW-4	RW-6	RW-7	RW-10
Average	129	0.61	1.01	0.69	2.31	0.16
Distance from RW-13	0	21	21	23	27	28

All measurements in inches H₂O.

PID readings from the vacuum pump vapor stack ranged from 640 to 675 ppm and showed a stable trend in concentration as the study progressed. Air flow readings from the vacuum pump vapor stack averaged 32 cfm and showed a stable trend in flow rate as the study progressed.

3.3 Pilot Study Conclusions

The full scale EFR pilot study indicated the following remediation system design criteria: ROI - 25 feet; individual recovery well flow rate – 4 to 6 gpm; individual recovery well drawdown - 4 feet below static groundwater; and, individual recovery well air flow rate - 50 cfm. According to the results of the recent pilot studies, the previous EFR design parameters can be duplicated with dual phase technology. The performance parameters for the dual phase approach using the pilot study data are the following:

ROI – 25 feet (based on distance vs. vacuum graphs); individual recovery well flow rate – 3 gpm (based on dual phase extraction test); individual recovery well drawdown - 5 feet below static groundwater (based on step drawdown and dual phase extraction tests); and, individual recovery well air flow rate - 50 cfm (average flow rate during dual phase extraction test). The latest pilot study data supports this position as presented below.

During this pilot study the pump intake was set approximately five feet below the static water level. This depth was selected to simulate the lowest drawdown reasonable with respect to the petroleum smear zone. The pilot studies' sustainable, vacuum enhanced flow rate of 3 gpm pumping from 5 feet below static water level was adequate to provide a capture zone size similar to the previous EFR design. This flow rate is less than the operational EFR flow rate of 6 gpm. The sustainable flow rate for the constant rate test (1 gpm) when compared to the selected flow rate for the dual phase test (3 gpm) indicated that the addition of a vacuum source significantly increases water flow potential of the aquifer.

The previous EFR data indicated that at the conclusion of step 1 the average recovery rate was 4 gpm and at step 2 the average recovery rate was 6.77 gpm. At 4 gpm the vacuum was 0.26 inch-H₂O at a monitoring point 20 feet from the extraction well. The latest pilot study data indicates a higher vacuum range (0.61 to 1.01) at approximately the same distance (21 to 23 feet) with a marginally lower flow rate (3 gpm). The previous EFR data indicated that at 4 gpm the drawdown was 0.35 feet at a monitoring point 20 feet from the extraction well. The latest data indicates a slightly higher drawdown range (0.43 to 0.52) at approximately the same distance (21 to 23 feet) with a marginally lower flow rate (3 gpm). These measurements indicate that the higher independent vacuum blower during the recent pilot study increased the drawdown and vacuum using a reduced water flow rate with respect to the EFR test.

Based on the data collected to date AEC has estimated that the minimum flow rate necessary to gain hydraulic control in the remediation zone is between 1 and 3 gpm (the constant rate flow estimate and the sustainable dual phase flow rate). The maximum flow rate is 5 to 6 gpm, which has been shown in the EFR pilot studies to substantially dewater the area. The optimal flow rate (or pump intake depth) for maximum recovery of LPH will change throughout the seasons. During wet weather seasons the flow rate will need to be increased (and/or the pump raised) and during dry seasons the flow rate will need to be decreased (and/or the pump lowered). For the early stages of the remedial life cycle it is expected that a higher flow rate will be necessary to provide hydraulic control. As the dewatering of the area reaches a static condition the required flow rate will be reduced for the same degree of hydraulic control.

The recent pilot study has indicated that an effective vacuum influence of 0.1-inch H₂O may be expected at a distance of approximately 25 feet from the recovery wells. In order to provide a safety factor the operational ROI will be 20 feet. Using multiple recovery points with partially overlapping capture zones it is expected that between 2-feet to 5-feet of groundwater drawdown will be realized in the target remediation zone.

The remediation system will be designed to treat recovered groundwater at a rate of 50 gpm and vapors at a rate of 600 cfm. Pilot studies have indicated that a recovery well flow rate of 3 gpm with 50 cfm at 10-inch hg is adequate for effective dual phase operation. The proposed number of recovery wells is 11 which equates to system flow rates of 33 gpm water and 550 cfm vapor. These rates are within the capacity of the design basis summary system design flow rates. Figure 9 in Appendix A presents the recovery well distribution with capture zones illustrated.

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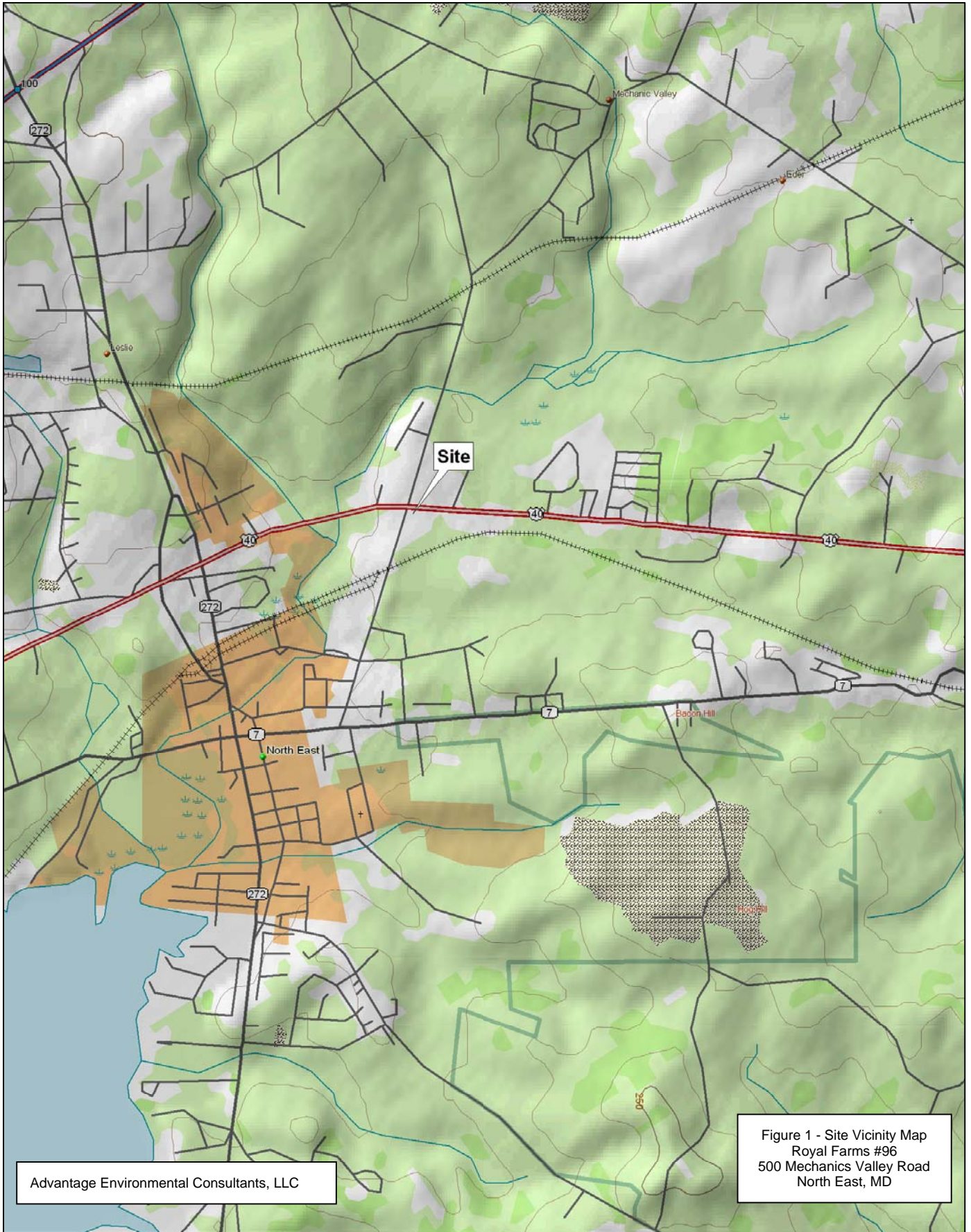
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Theis, C.V., 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, Am. Geophys. Union Trans., vol. 16, pp. 519-524.

APPENDIX A



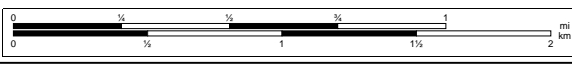
Advantage Environmental Consultants, LLC

Figure 1 - Site Vicinity Map
 Royal Farms #96
 500 Mechanics Valley Road
 North East, MD



© 2001 DeLorme. Topo USA® 3.0
 Zoom Level: 12-7 Datum: WGS84

Scale: 1" = 28.125'
 1" = 2,343.75 ft



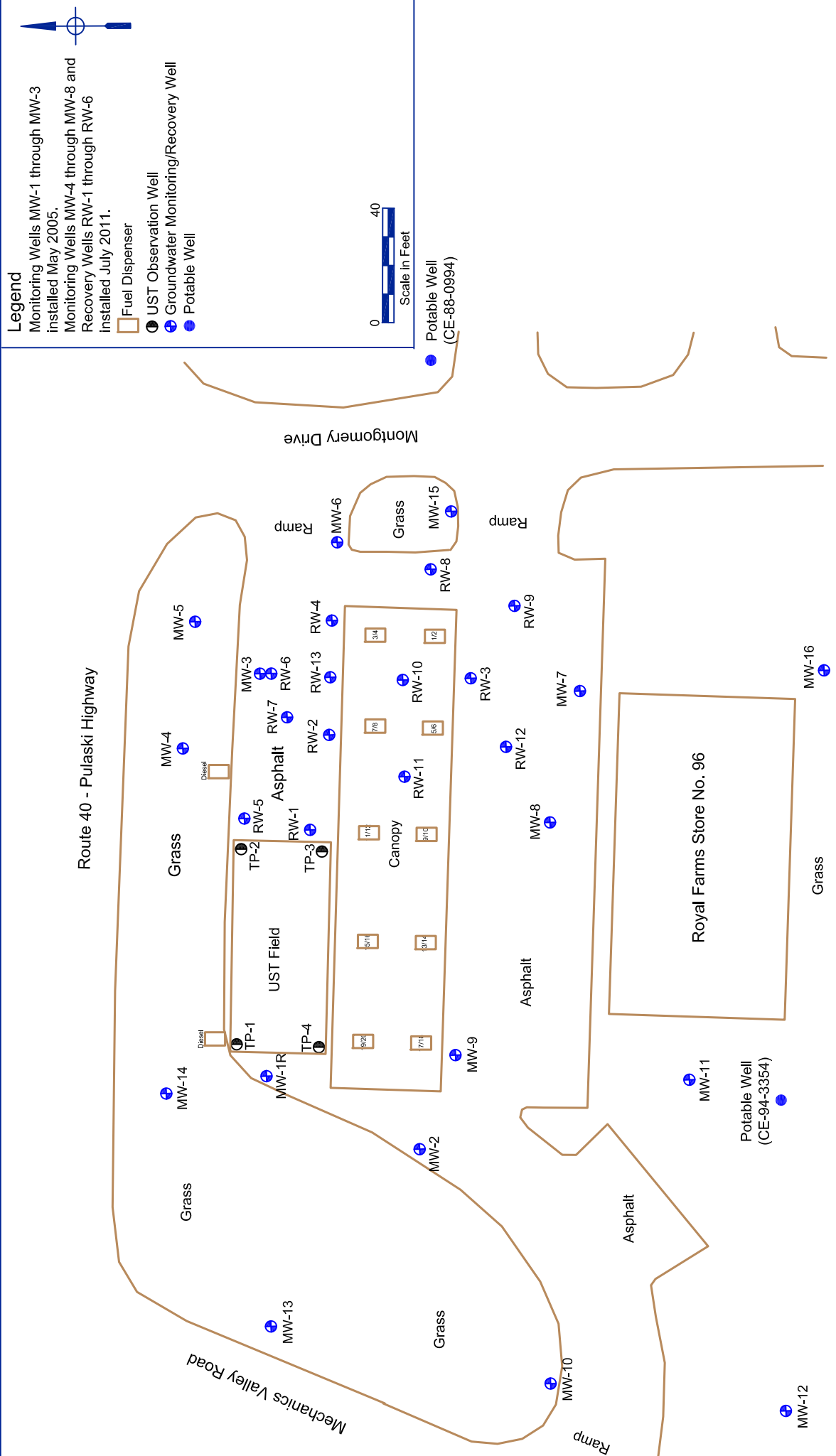


Figure 2 - Site Features Map
 Royal Farms No. 96
 500 Mechanics Valley Road
 North East, MD

Project No.: 05-056	Drawn by: JSS
Task No.: RF96	Date: 1-23-12
File: Site Features	Revision No.: 1

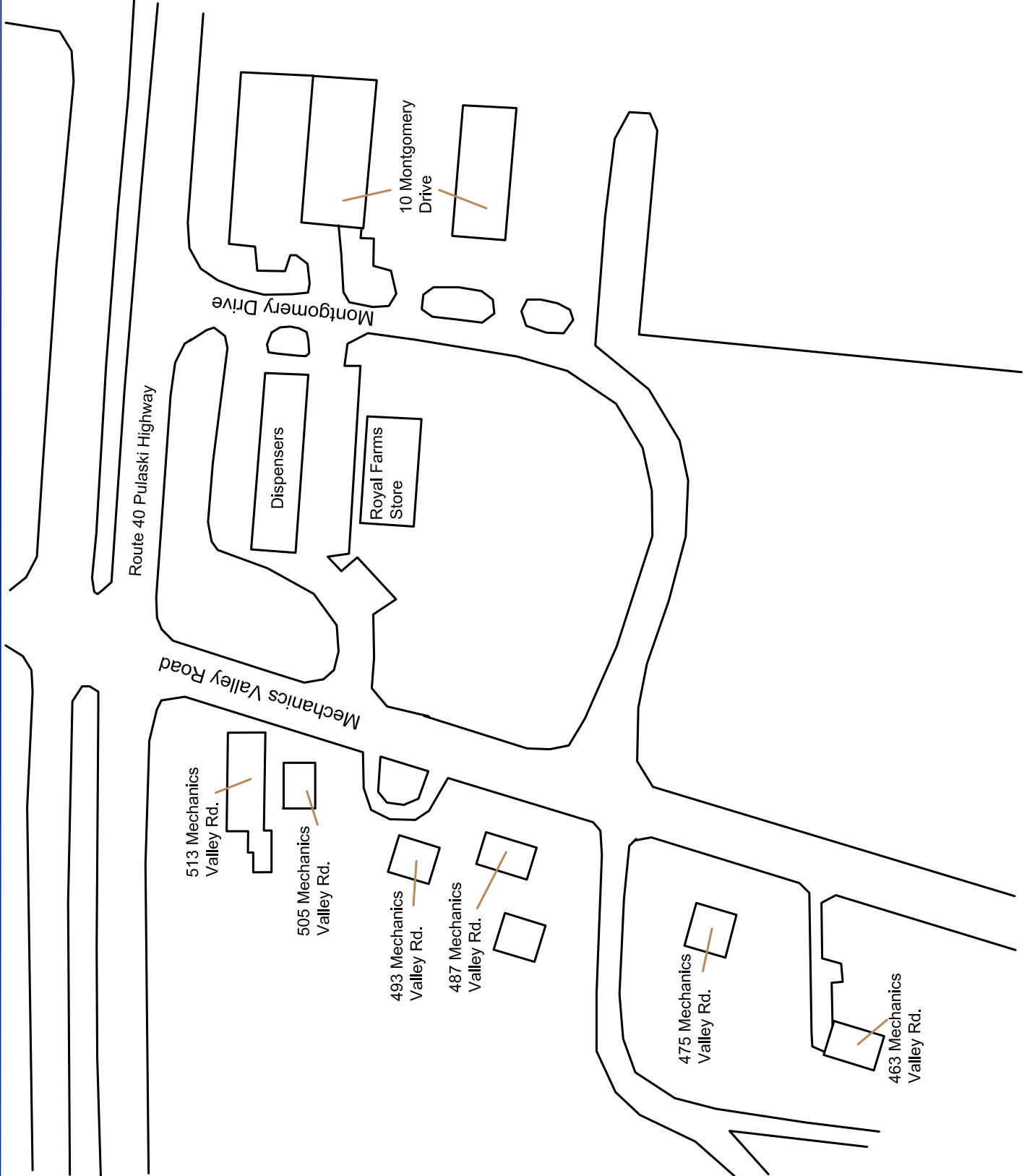
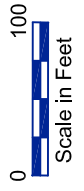
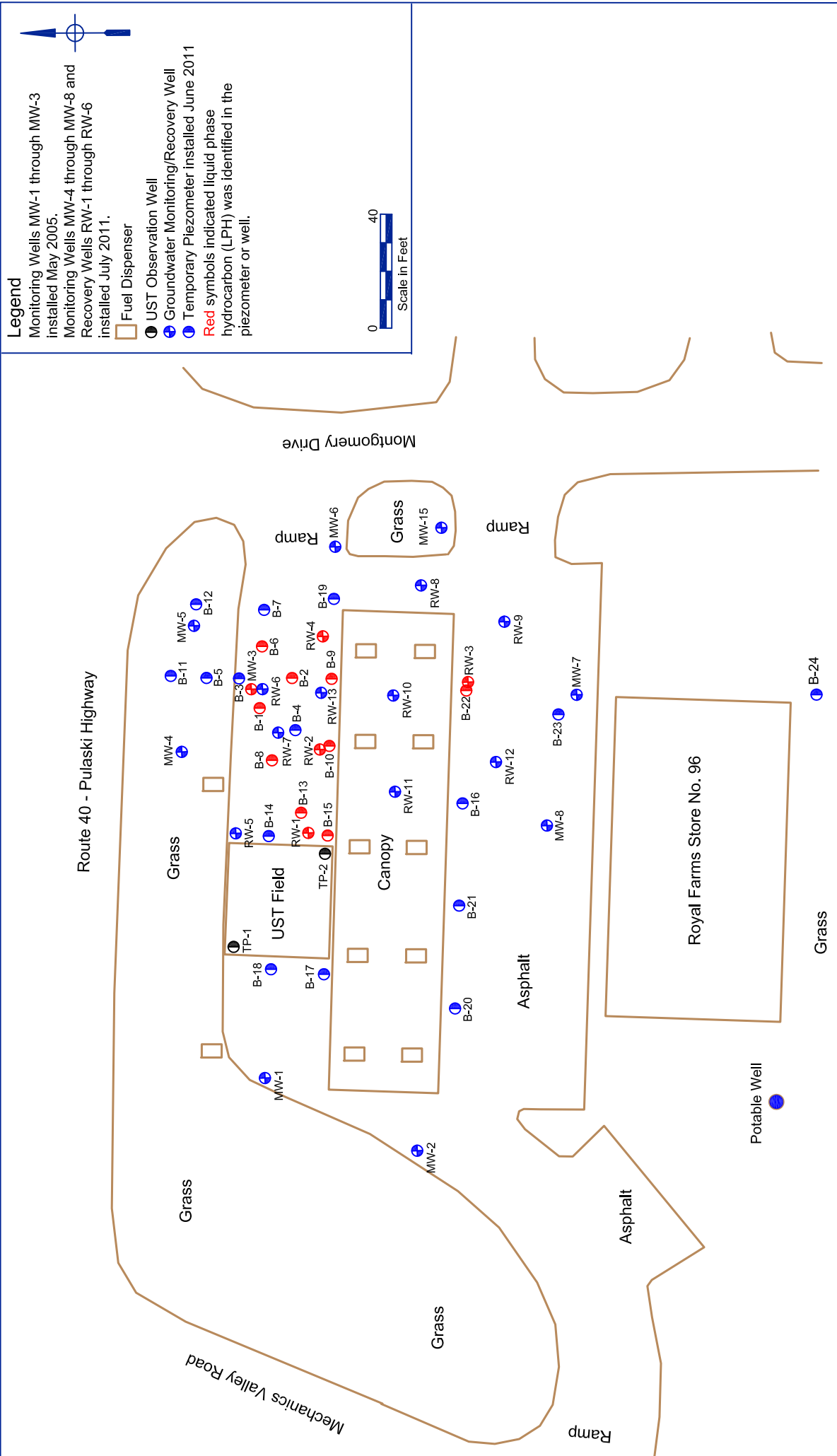


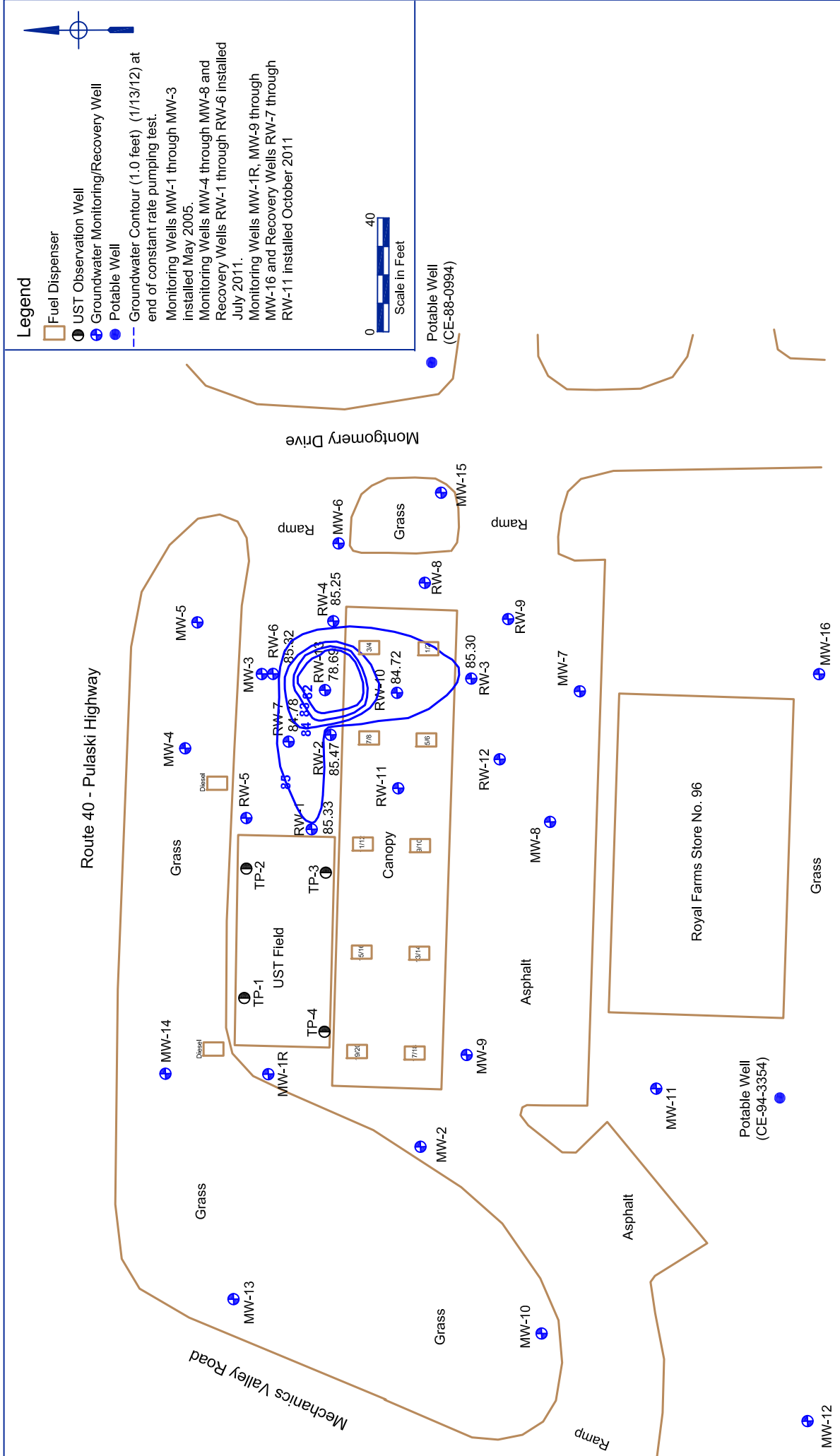
Figure 3 - Site Area Map
 Royal Farms No. 96
 500 Mechanics Valley Road
 North East, MD

Project No.: 05-056	Drawn by: JSS
Task No.: RF96	Date: 1-23-12
File: Site Area	Revision No.: 1

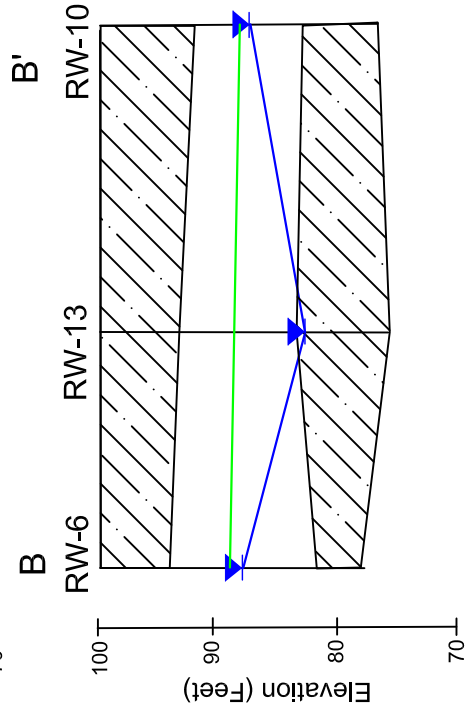
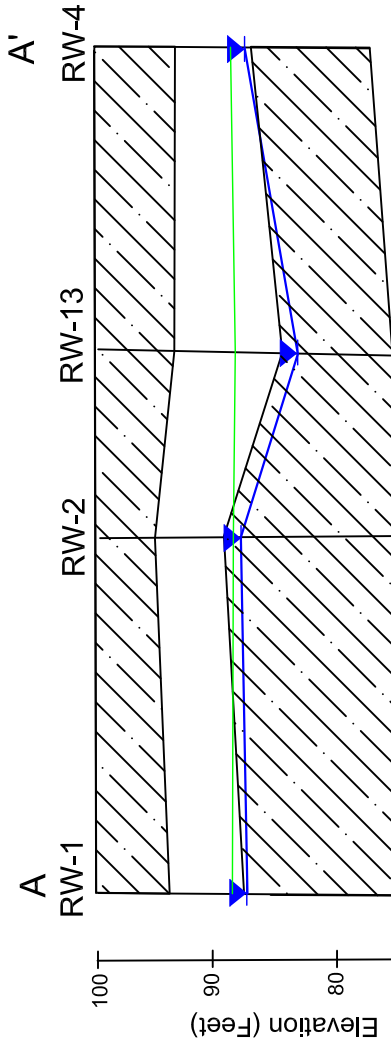
Advantage Environmental Consultants, LLC
 8610 Washington Blvd. Suite 217
 Jessup, MD 20794
 Phone 301-776-0500 Fax 301-776-1123



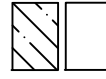
<p>Advantage Environmental Consultants, LLC 8610 Washington Blvd, Suite 217 Jessup, MD 20794 Phone 301-776-0500 Fax 301-776-1123</p>		<p>Project No.: 05-056 Task No.: RF96 File: Remed Zone</p>	<p>Drawn by: JSS Date: 8-2-11 Revision No.: 1</p>	<p>Figure 4 - LPH Distribution Map Royal Farms No. 96 500 Mechanics Valley Road North East, MD</p>
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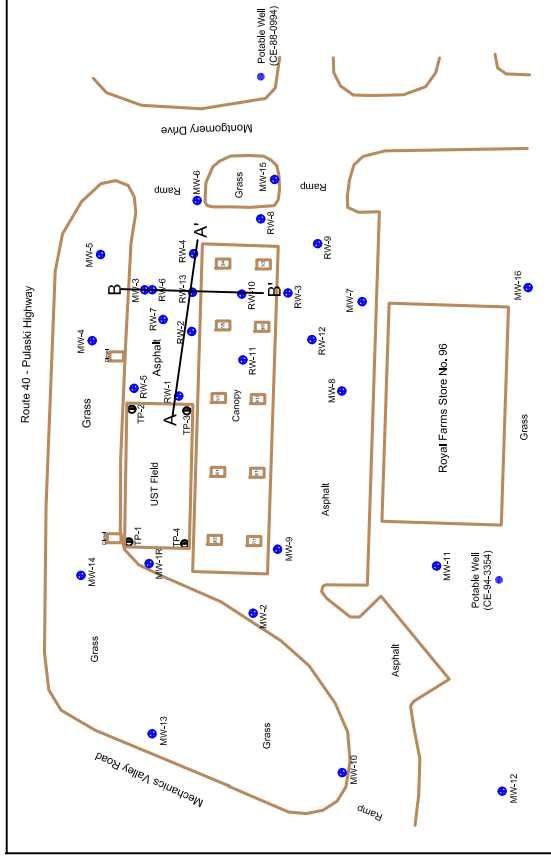
Advantage Environmental Consultants, LLC 8610 Washington Blvd, Suite 217 Jessup, MD 20794 Phone 301-776-0500 Fax 301-776-1123		Project No.: 05-056 Task No.: RF96 File: Site Features	Drawn by: JDW Date: 1-10-12 Revision No.: 3
Figure 5 - Groundwater Gradient Map - Pumping Conditions Royal Farms No. 96 500 Mechanics Valley Road North East, MD			



Legend



- Water level (1-13-2012) taken at end of constant rate pumping test.
- Water table surface taken at end of constant rate pumping test.
- Static (pre-test) water table surface (taken on 1-12-12)

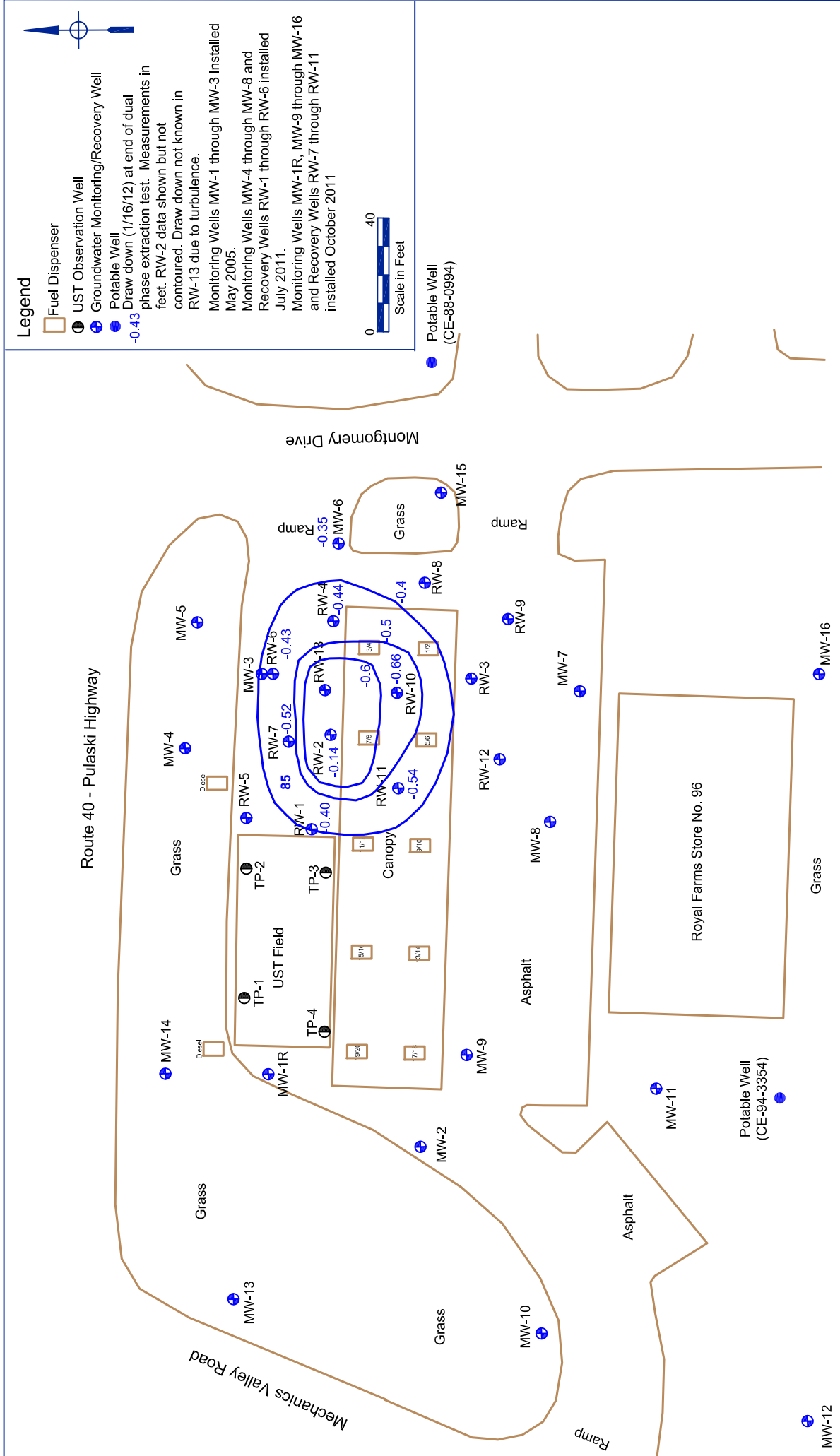


Trace of Sections

Advantage Environmental Consultants, LLC
 8610 Washington Boulevard, Suite 217
 Jessup, Maryland 20794
 301-776-0500

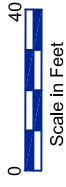
Drawn by: JSS	Checked by: JSS
Date: 1-21-12	Revision: First

Figure 6 - Cross Sections - Pumping Conditions at End of Constant Rate Test
Royal Farms No. 96
 500 Mechanics Valley Road, North East, Maryland

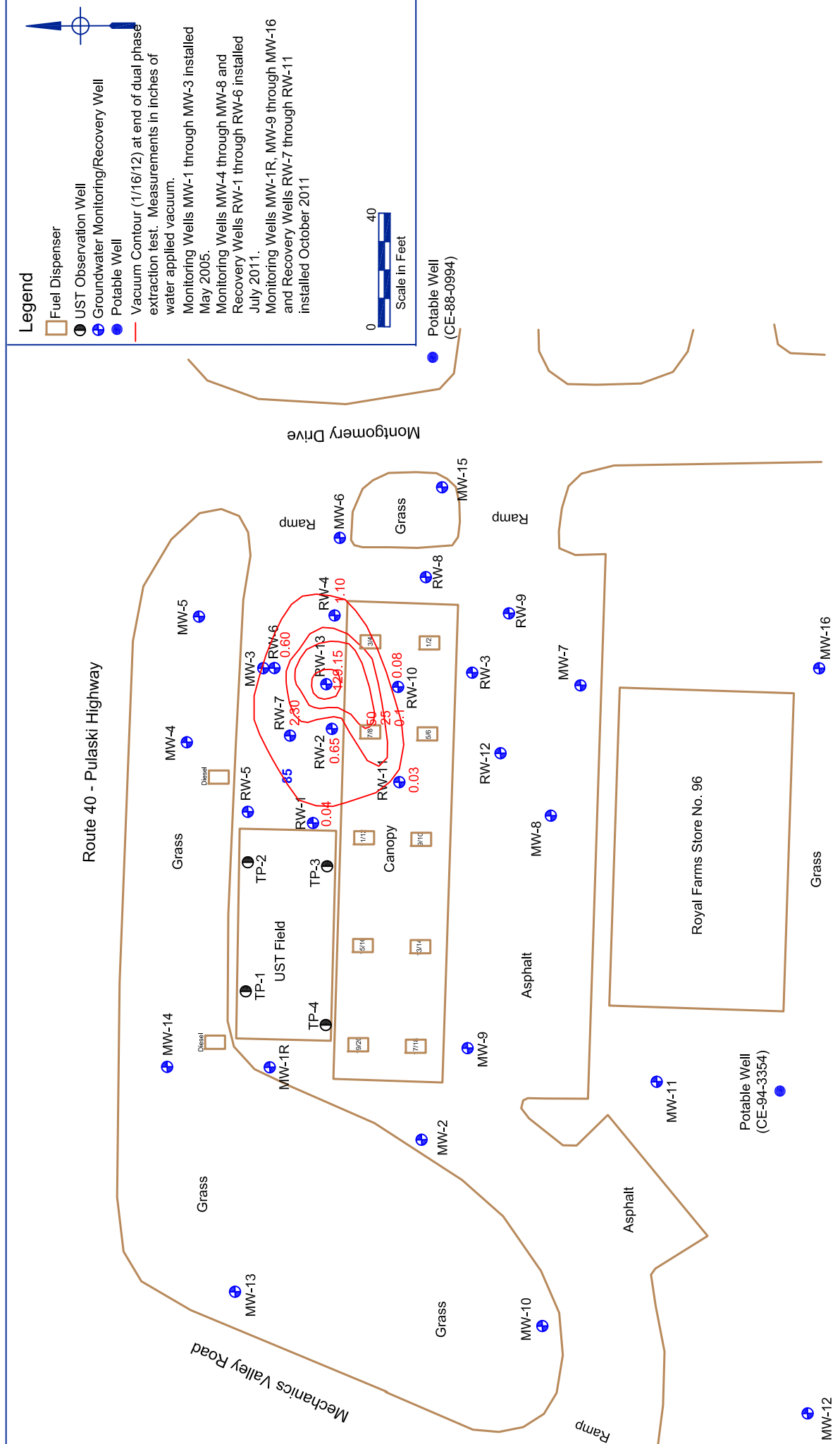


Legend

- Fuel Dispenser
 - UST Observation Well
 - Groundwater Monitoring/Recovery Well
 - Potable Well
 - Draw down (1/16/12) at end of dual phase extraction test. Measurements in feet. RW-2 data shown but not contoured. Draw down not known in RW-13 due to turbulence.
- Monitoring Wells MW-1 through MW-3 installed May 2005.
 Monitoring Wells MW-4 through MW-8 and Recovery Wells RW-1 through RW-6 installed July 2011.
 Monitoring Wells MW-1R, MW-9 through MW-16 and Recovery Wells RW-7 through RW-11 installed October 2011



Advantage Environmental Consultants, LLC 8610 Washington Blvd, Suite 217 Jessup, MD 20794 Phone 301-776-0500 Fax 301-776-1123		Project No.: 05-056	Drawn by: JDW
		Task No.: RF96	Date: 1-10-12
File: Site Features		Revision No.: 3	Figure 7 - EFR Drawdown Contour Map Royal Farms No. 96 500 Mechanics Valley Road North East, MD



Legend

- Fuel Dispenser
 - UST Observation Well
 - Groundwater Monitoring/Recovery Well
 - Potable Well
 - Vacuum Contour (1/16/12) at end of dual phase extraction test. Measurements in inches of water applied vacuum.
- Monitoring Wells MW-1 through MW-3 installed May 2005.
 Monitoring Wells MW-4 through MW-8 and Recovery Wells RW-1 through RW-6 installed July 2011.
 Monitoring Wells MW-1R, MW-9 through MW-16 and Recovery Wells RW-7 through RW-11 installed October 2011

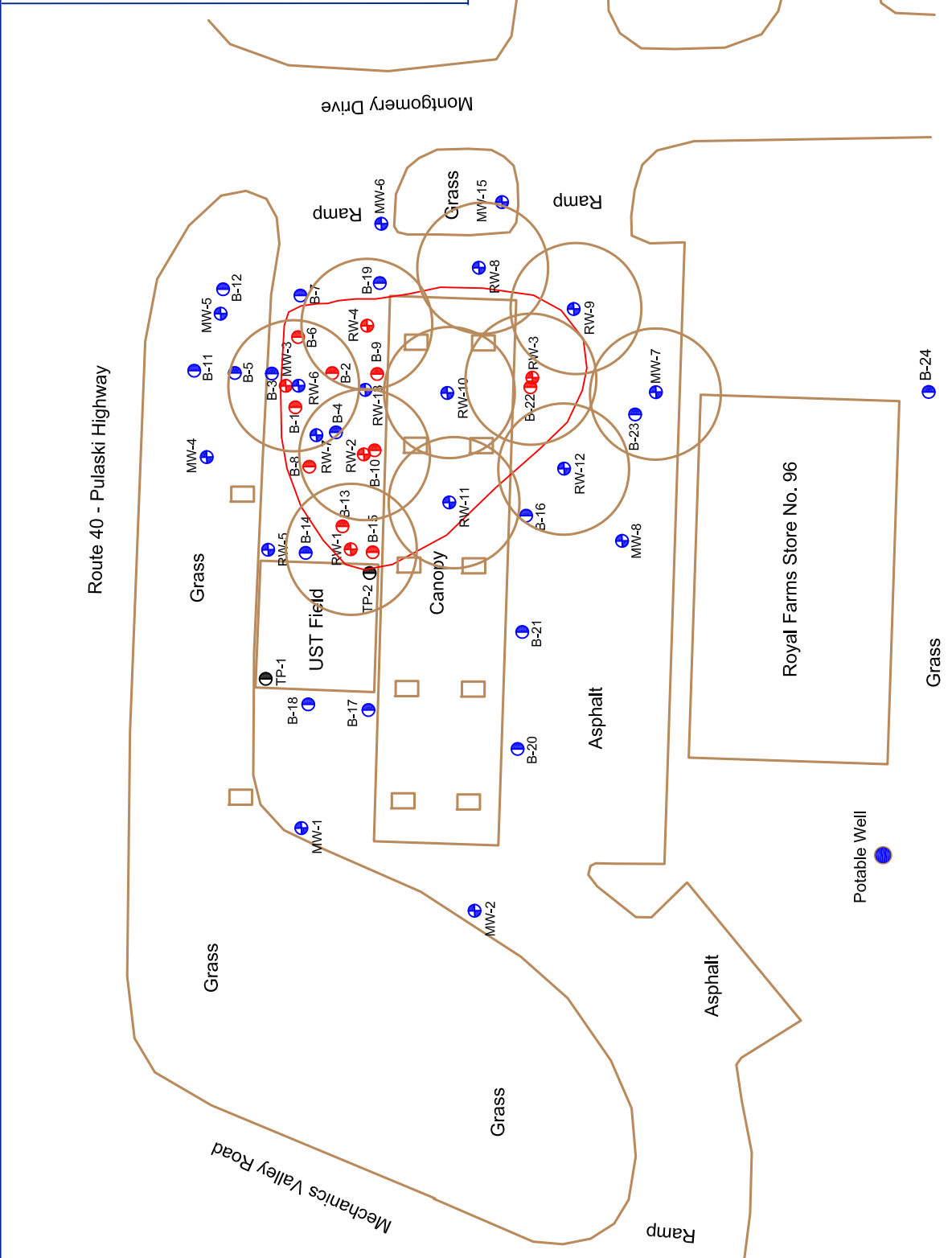


<p>Advantage Environmental Consultants, LLC 8610 Washington Blvd, Suite 217 Jessup, MD 20794 Phone 301-776-0500 Fax 301-776-1123</p>		<p>Project No.: 05-056 Task No.: RF96 File: Site Features</p>	<p>Drawn by: JDW Date: 1-10-12 Revision No.: 3</p>
<p>Figure 8 - Applied Vacuum Gradient Map Royal Farms No. 96 500 Mechanics Valley Road North East, MD</p>			

Legend

- Monitoring Wells MW-1 through MW-3 installed May 2005.
- Monitoring Wells MW-4 through MW-8 and Recovery Wells RW-1 through RW-6 installed July 2011.
- Fuel Dispenser
- UST Observation Well
- Groundwater Monitoring/Recovery Well
- Temporary Piezometer Installed June 2011
- Red symbols indicated liquid phase hydrocarbon (LPH) was identified in the piezometer or well.
- Suspected Limits of LPH
- Enhanced Fluid Recovery (EFR)
- Well Capture Zone (20 feet)

Scale in Feet



<p>Advantage Environmental Consultants, LLC 8610 Washington Blvd, Suite 217 Jessup, MD 20794 Phone 301-776-0500 Fax 301-776-1123</p>		<p>Project No.: 05-056 Task No.: RF96 File: Remed Zone</p>	<p>Drawn by: JSS Date: 1-21-12 Revision No.: 2</p>	<p>Figure 9 - Proposed Remediation Zone Map Royal Farms No. 96 500 Mechanics Valley Road North East, MD</p>
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APPENDIX B

Petroleum Management, Inc.

MD. Oil Operations Permit No: 2009-OPT-31821
 EPA Identification No: MDR-000522794
 Federal ID No: 52-2014536

5218 Curtis Avenue ♦ Baltimore, Maryland 21226 ♦ Phone 410-354-0200 ♦ Fax 410-354-0201

Bill of Lading/Manifest

Nº 5524

Generator/Shipper: ROYAL FARMS		Billing Name: ROYAL FARMS	
Site Address: 500 MECHANICS VALLEY ROAD		Address:	
City: NORTH EAST	State: MD Zip:	City:	State: Zip:
Phone: ()	Contact:	Phone: ()	Contact:

Purchase Order NO:

MATERIAL CHARACTERIZATION (CHECK ALL THAT APPLY):

Description:	Gallons	Description:	Gallons	Description:	Gallons
Gasoline, 3, UN1203, PGII		Hazardous Waste, Liquid, 9 NA3082, PGIII		JP#4	
#2 Fuel Oil, 3, NA1993, PGIII		Hazardous Waste, Solid, 9 NA3077, PGIII		JP#5	
#4 Fuel Oil, 3 NA1993, PGIII		Paint Thinners, 3, UN1263, PGI		Jet A	
#6 Fuel Oil, 3, NA1993, PGIII		Ethylene Glycol, 9, UN3082, PGIII		Sludge	
Diesel, 3, NA1993, PGIII		Lube Oil		Petroleum Contaminated Water	250
Flammable Liquids, NOS, 3, UN1993, PGI		Waste Oil		Other:	
Corrosive Liquids, NOS, 8, UN1760, PGII		Kerosene		Other:	
No. of Drums		No. of Tanks:		Other:	
Scale Weights (Soil): Total: (Tons)		Tare: (Tons)		Net: (Tons)	

Service Description: **FER ON WAILS ON SITE**

PLACARDS TENDERED: YES NO

EMERGENCY CONTACT (410) 760-3703

Generator/Shipper Certification Statement

As the generator or shipper, I hereby certify that this material is properly classified and does not contain Polychlorinated Biphenyls (PCB'S). To the best of my knowledge it has not been mixed, combined or blended in any amount with any other material defined as hazardous waste under applicable law. Generator/Shipper agrees to indemnify and hold Petroleum Management, Inc. harmless for any damages arising from or in any way relating to a breach of this Certification Statement.

<input checked="" type="checkbox"/> Generator/Shipper Authorized Agent (Print) [Signature]	Date of Service JANUARY 12, 2012
<input checked="" type="checkbox"/> Generator/Shipper Authorized Agent Signature	

HAULER/CARRIER INFORMATION

Co. Name Petroleum Management, Inc.	Driver Name (print) KELLY SILVER
Street 5218 Curtis Avenue	Driver Signature [Signature]
City Baltimore	Phone 301-960-0300
State MD	Zip 21226

The above mentioned materials have been received by this facility and will be handled in accordance with all applicable rules and regulations. All quantities are subject to final verification by this facility and are indicated in far right box.	RECEIVING FACILITY ACCEPTANCE	
	Facility Name	
	Acceptance Signature	
Phone	Total Quantity Received	

White - Original Yellow - Transporter Pink - Facility Gold - Customer



Petroleum Management, Inc.



Day: THURSDAY

Date: JANUARY 12, 2012

Job Location: ROYAL FARMS
500 MECHANICS VALLEY ROAD
NORTH EAST, M.D.

Bill To: ROYAL FARMS

Contact: _____
Phone: _____

Contact: _____
Phone: _____

JOB DESCRIPTION:

EFER ON WELLS ON SITE

Title / Name	Equipment Type/ Number	Start Time	Stop Time	Total Hours
<u>DRIVER / KELLY SILVER</u>	<u>VAC # 5</u>	<u>7:30AM</u>	<u>5:30PM</u>	<u>10</u>

Materials:

Description	Quantity
<u>2" HOSE</u>	<u>1</u>

SubContractors:

Disposal:

	Amount in Gallons	Manifest Number
<u>Liquid Disposal</u>	<u>250</u>	<u>5524</u>
<u>Sludge Disposal</u>		
<u>Other</u>		

Petroleum Management

Print Name: KELLY SILVER

Signature: [Signature]

Date: JANUARY 12, 2012

Client

Print Name: JEFF SKIN

Signature: [Signature]

Date: _____

Petroleum Management, Inc.

MD. Oil Operations Permit No: 2008-OPT-31821
 EPA Identification No: MDR-000522794
 Federal ID No: 52-2014536

5218 Curtis Avenue ♦ Baltimore, Maryland 21226 ♦ Phone 410-354-0200 ♦ Fax 410-354-0201

Bill of Lading/Manifest

Nº 5604

Generator/Shipper: ROYAL FARMS		Billing Name: ROYAL FARMS	
Site Address: 500 MECHANICS VALLEY ROAD		Address:	
City: NORTH EAST	State: MD Zip:	City:	State: Zip:
Phone: ()	Contact:	Phone: ()	Contact:

Purchase Order NO:

MATERIAL CHARACTERIZATION (CHECK ALL THAT APPLY):

Description:	Gallons	Description:	Gallons	Description:	Gallons
Gasoline, 3, UN1203, PGII		Hazardous Waste, Liquid, 9 NA3082, PGIII		JP#4	
#2 Fuel Oil, 3, NA1993, PGIII		Hazardous Waste, Solid, 9 NA3077, PGIII		JP#5	
#4 Fuel Oil, 3 NA1993, PGIII		Paint Thinners, 3, UN1263, PGI		Jet A	
#6 Fuel Oil, 3, NA1993, PGIII		Ethylene Glycol, 9, UN3082, PGIII		Sludge	
Diesel, 3, NA1993, PGIII		Lube Oil		Petroleum Contaminated Water	450
Flammable Liquids, NOS, 3, UN1993, PGI		Waste Oil		Other:	
Corrosive Liquids, NOS, 8, UN1760, PGII		Kerosene		Other:	
No. of Drums		No. of Tanks:		Other:	
Scale Weights (Soil): Total: (Tons)		Tare: (Tons)		Net: (Tons)	

Service Description: **ERR ON WELLS ONSITE**

PLACARDS TENDERED: YES NO

EMERGENCY CONTACT (410) 760-3703

Generator/Shipper Certification Statement

As the generator or shipper, I hereby certify that this material is properly classified and does not contain Polychlorinated Biphenyls (PCB'S). To the best of my knowledge it has not been mixed, combined or blended in any amount with any other material defined as hazardous waste under applicable law. Generator/Shipper agrees to indemnify and hold Petroleum Management, Inc. harmless for any damages arising from or in any way relating to a breach of this Certification Statement.

<input checked="" type="checkbox"/> Generator/Shipper Authorized Agent (Print)	Date of Service
<i>Arthur P. King</i>	JANUARY 13, 2012
<input checked="" type="checkbox"/> Generator/Shipper Authorized Agent Signature	
<i>[Signature]</i>	

HAULER/CARRIER INFORMATION

Co. Name	Driver Name (print)
Petroleum Management, Inc.	KELLY SIMLER
Street	Driver Signature
5218 Curtis Avenue	<i>[Signature]</i>
City	Phone
Baltimore	301-860-0300
State	Zip
MD	21226

The above mentioned materials have been received by this facility and will be handled in accordance with all applicable rules and regulations. All quantities are subject to final verification by this facility and are indicated in far right box.

RECEIVING FACILITY ACCEPTANCE

Facility Name	Total Quantity Received
Acceptance Signature	
Phone	

White - Original Yellow - Transporter Pink - Facility Gold - Customer



Petroleum Management, Inc.



Day: FRIDAY

Date: JANUARY 13, 2012

Job Location: ROYAL FARMS
500 MECHANICS VALLEY ROAD
NORTH EAST, MD

Contact: _____
Phone: _____

Bill To: ROYAL FARMS

Contact: _____
Phone: _____

JOB DESCRIPTION:

EFF ON WELLS ONSITE

Title / Name	Equipment Type/ Number	Start Time	Stop Time	Total Hours
<u>DEWIER / KELLY SILVER</u>	<u>VAC # 5</u>	<u>9:00AM</u>	<u>5:00PM</u>	<u>8</u>

Materials:

Description	Quantity
<u>2" HOSE</u>	<u>1</u>

SubContractors:

Disposal:

	Amount in Gallons	Manifest Number
<u>Liquid Disposal</u>	<u>450</u>	<u>5604</u>
<u>Sludge Disposal</u>		
<u>Other</u>		

Petroleum Management

Print Name: KELLY SILVER
Signature: [Signature]
Date: JANUARY 13, 2012

Client

Print Name: Anthony B. K...
Signature: [Signature]
Date: 1/13/12

Petroleum Management, Inc.

MD. Oil Operations Permit No: 2009-OPT-31821
 EPA Identification No: MDR-000522794
 Federal ID No: 52-2014536

5218 Curtis Avenue ♦ Baltimore, Maryland 21226 ♦ Phone 410-354-0200 ♦ Fax 410-354-0201

Bill of Lading/Manifest **No 5605**

Generator/Shipper: ROYAL FARMS		Billing Name: ROYAL FARMS	
Site Address: 50 MEGANUS VALLEY ROAD		Address:	
City: Norwalk	State: MD Zip:	City:	State: Zip:
Phone: ()	Contact:	Phone: ()	Contact:

Purchase Order NO:

MATERIAL CHARACTERIZATION (CHECK ALL THAT APPLY):

Description:	Gallons	Description:	Gallons	Description:	Gallons
Gasoline, 3, UN1203, PGII		Hazardous Waste, Liquid, 9 NA3082, PGIII		JP#4	
#2 Fuel Oil, 3, NA1993, PGIII		Hazardous Waste, Solid, 9 NA3077, PGIII		JP#5	
#4 Fuel Oil, 3 NA1993, PGIII		Paint Thinners, 3, UN1263, PGI		Jet A	
#6 Fuel Oil, 3, NA1993, PGIII		Ethylene Glycol, 9, UN3082, PGIII		Sludge	
Diesel, 3, NA1993, PGIII		Lube Oil		Petroleum Contaminated Water	700
Flammable Liquids, NOS, 3, UN1993, PGI		Waste Oil		Other:	
Corrosive Liquids, NOS, 8, UN1760, PGI		Kerosene		Other:	
No. of Drums		No. of Tanks:		Other:	
Scale Weights (Soil): Total: (Tons)		Tare: (Tons)		Net: (Tons)	

Service Description: **ROAD TO A DIRECTOR**

PLACARDS TENDERED: YES NO EMERGENCY CONTACT (410) 760-3703

Generator/Shipper Certification Statement
 As the generator or shipper, I hereby certify that this material is properly classified and does not contain Polychlorinated Biphenyls (PCB'S). To the best of my knowledge it has not been mixed, combined or blended in any amount with any other material defined as hazardous waste under applicable law. Generator/Shipper agrees to indemnify and hold Petroleum Management, Inc. harmless for any damages arising from or in any way relating to a breach of this Certification Statement.

X Generator/Shipper Authorized Agent (Print) **Jim Wolf** Date of Service **JANUARY 16 2002**
X Generator/Shipper Authorized Agent Signature **[Signature]**

HAULER/CARRIER INFORMATION

Co. Name **Petroleum Management, Inc.** Driver Name (print) **Kelly Silver**
 Street **5218 Curtis Avenue** Driver Signature **[Signature]**
 City **Baltimore** State **MD** Zip **21226** Phone **301-820-0300**

The above mentioned materials have been received by this facility and will be handled in accordance with all applicable rules and regulations. All quantities are subject to final verification by this facility and are indicated in far right box.

RECEIVING FACILITY ACCEPTANCE
 Facility Name _____
 Acceptance Signature _____
 Phone _____ Total Quantity Received _____

White - Original Yellow - Transporter Pink - Facility Gold - Customer



Petroleum Management, Inc.



Day: MONDAY

Date: JANUARY 16, 2012

Job Location: ROYAL FARMS
500 MECHANICS VALLEY ROAD
NORTH EAST, M.D.

Bill To: ROYAL FARMS

Contact: _____
Phone: _____

Contact: _____
Phone: _____

JOB DESCRIPTION:

PUMP OUT ASE DIRECTED

Title / Name	Equipment Type/ Number	Start Time	Stop Time	Total Hours
<u>DENVER/ KELLY SILVER</u>	<u>VAC # 5</u>	<u>8:00 AM</u>		

Materials:

Description	Quantity
<u>2" HOSE</u>	<u>1</u>

SubContractors:

Disposal:

	Amount in Gallons	Manifest Number
<u>Liquid Disposal</u>	<u>700</u>	<u>5605</u>
<u>Sludge Disposal</u>		
<u>Other</u>		

Petroleum Management

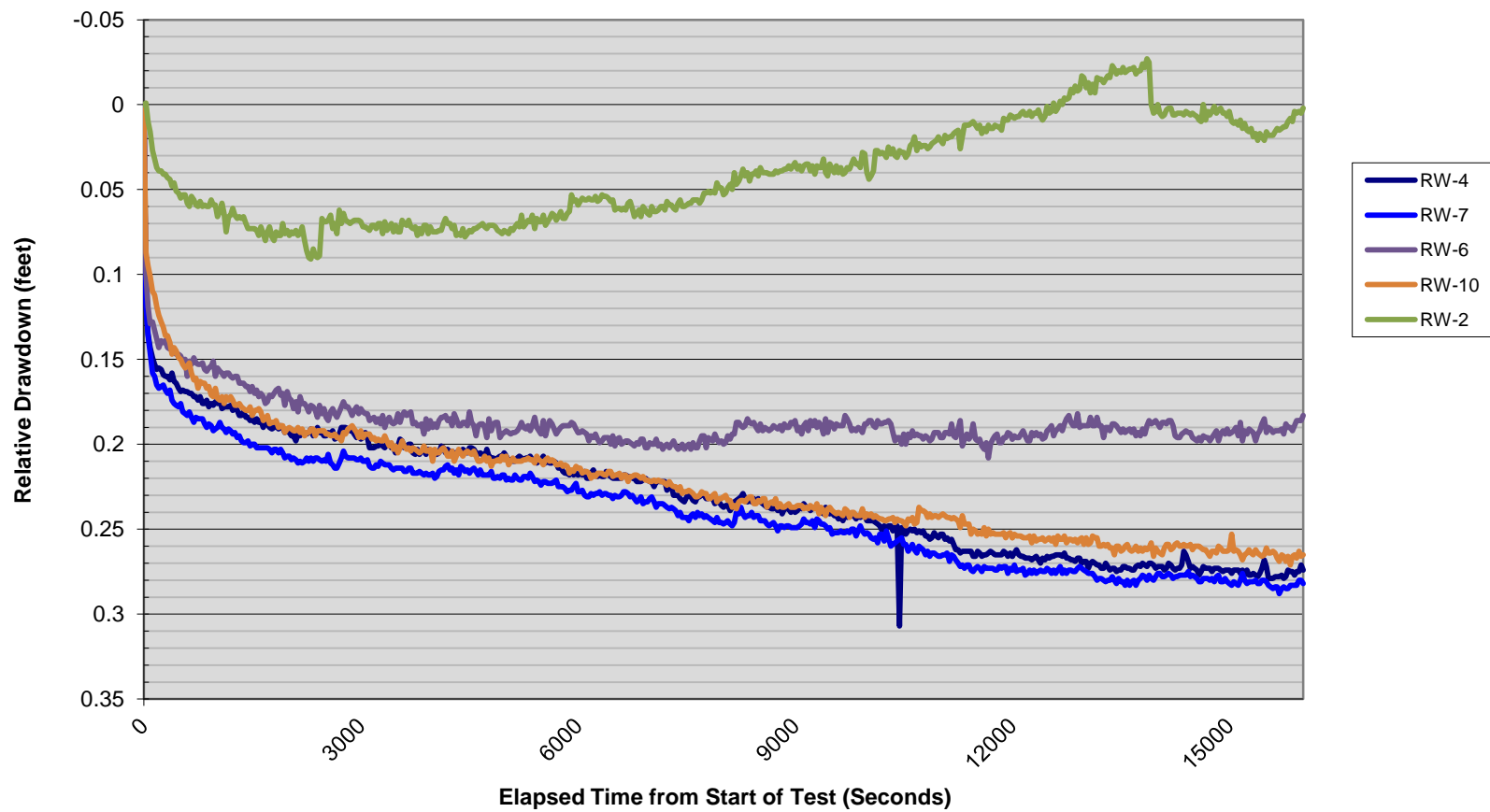
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Signature: [Signature]
Date: JANUARY 16, 2012

Client

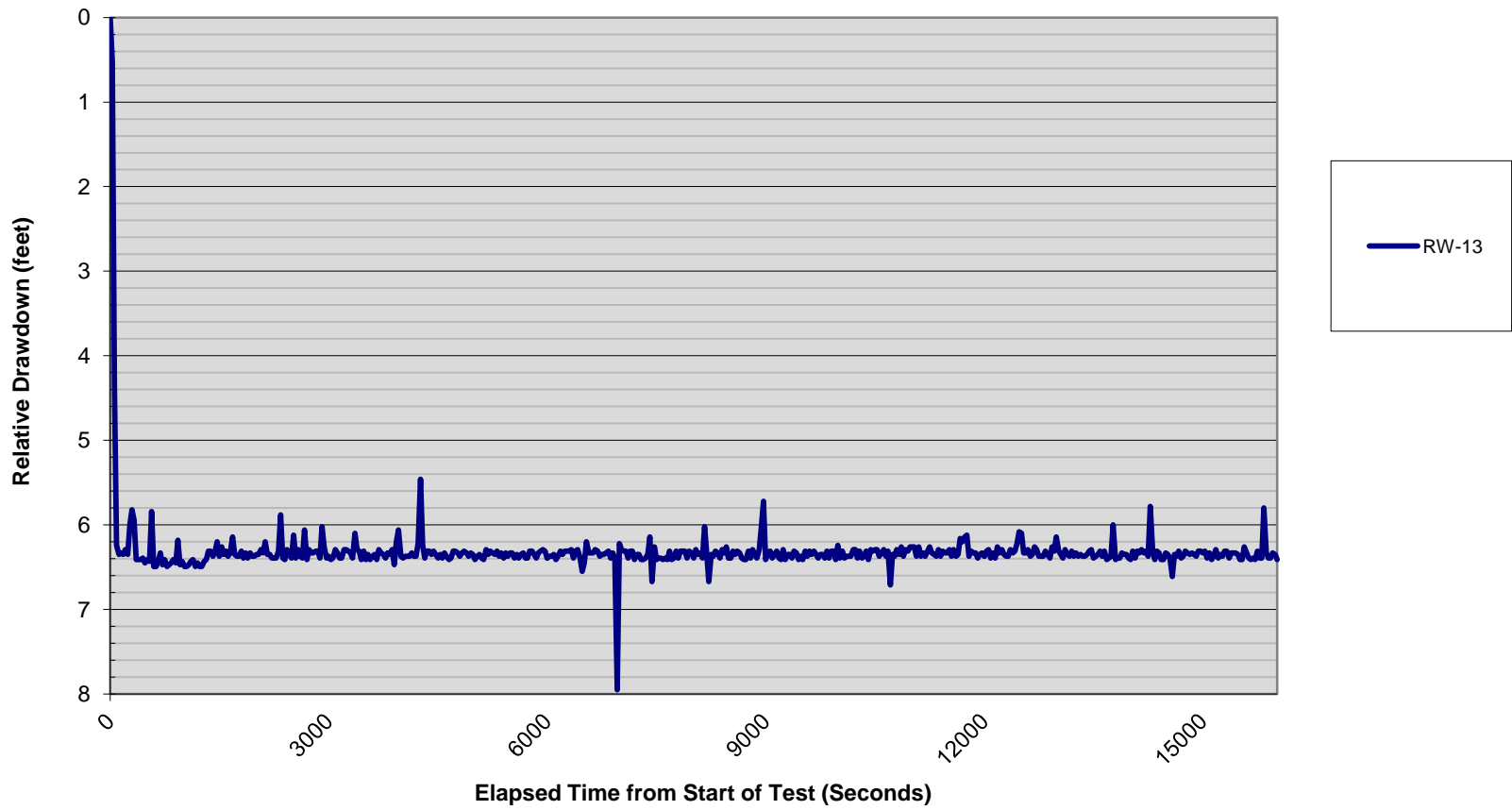
Print Name: James Wolf
Signature: [Signature]
Date: 1-16-12

APPENDIX C

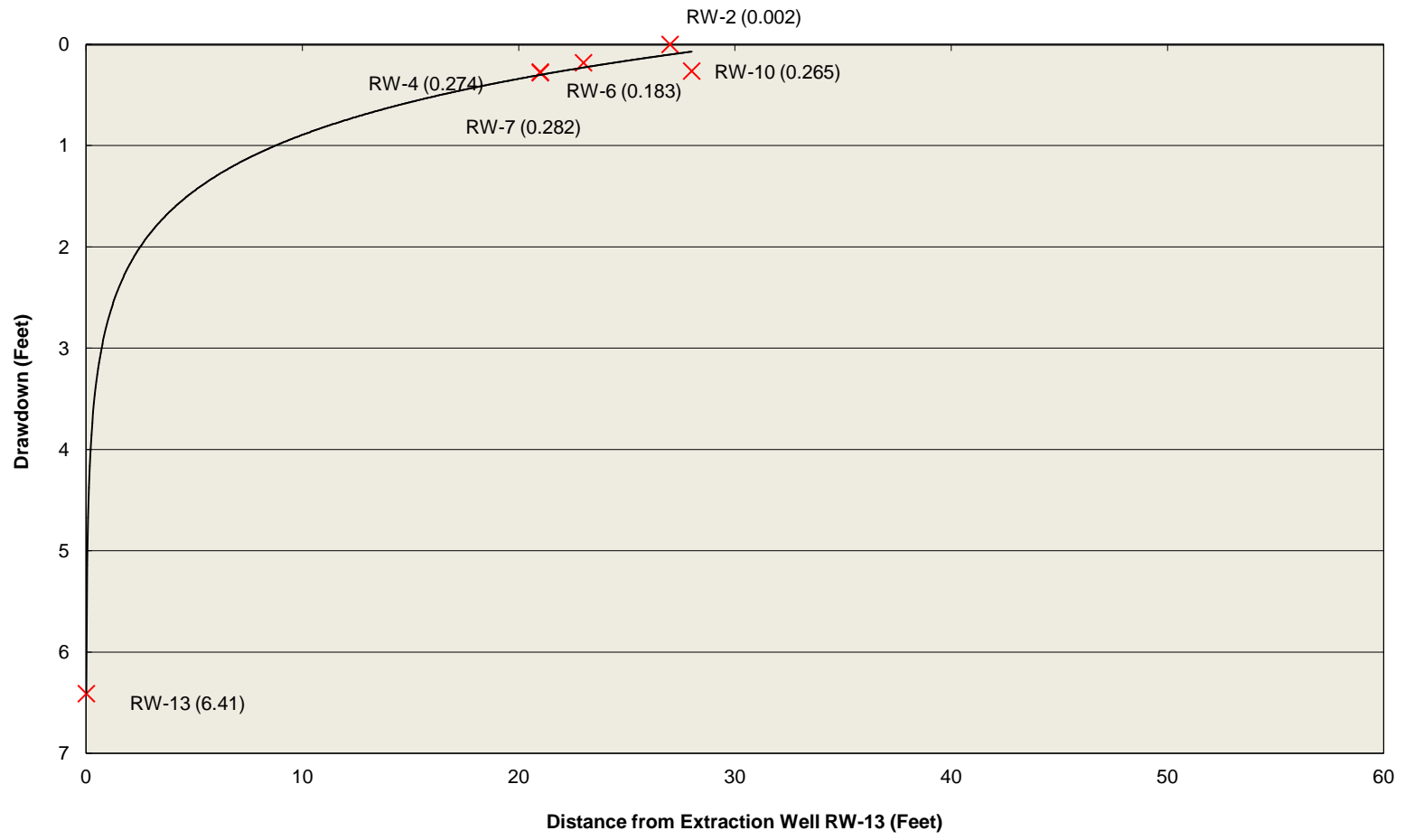
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Constant Rate Pumping Test
January 13th, 2012
Drawdown Vs. Time For RW-2, RW-4, RW-6, RW-7, and RW-10



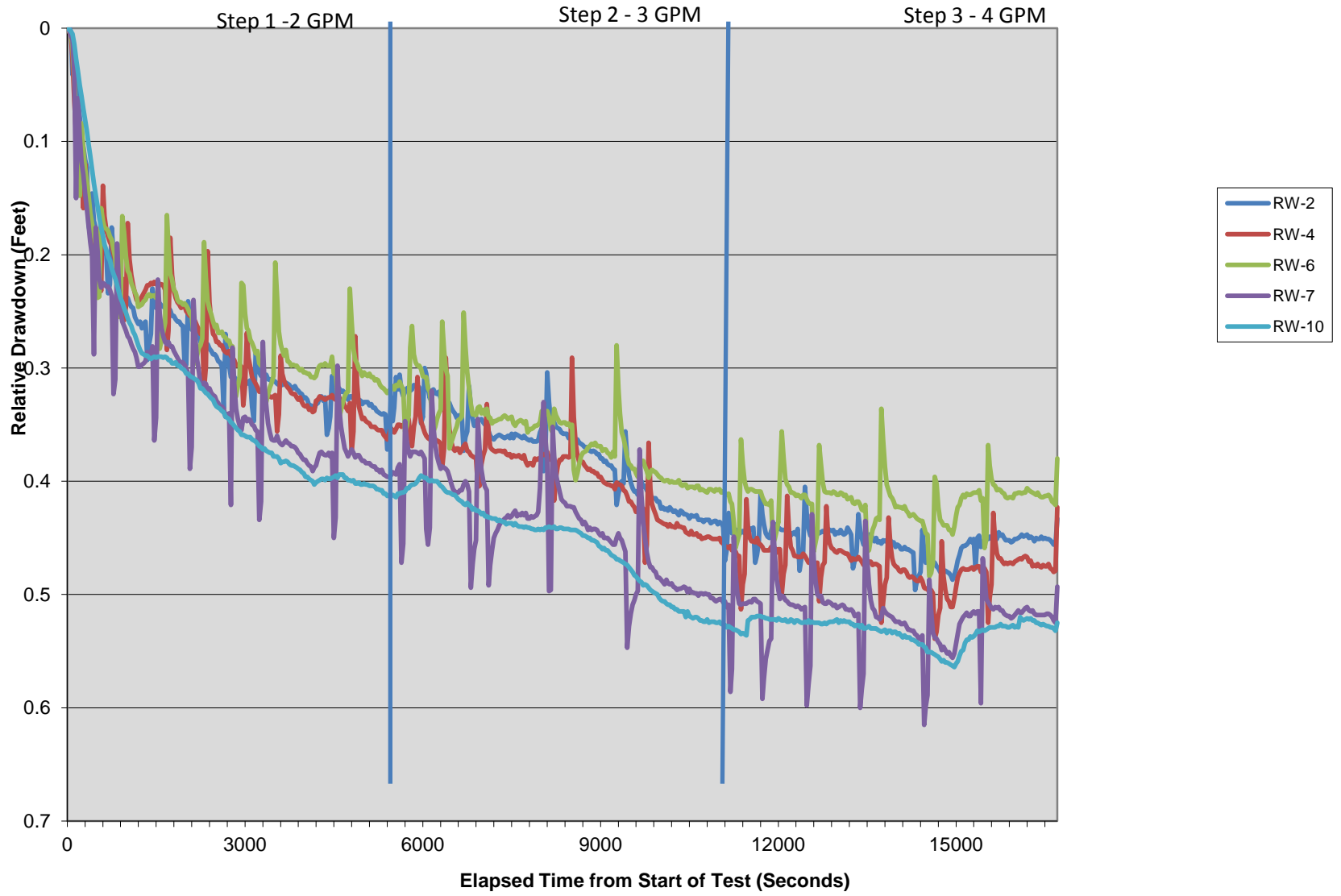
Graph 2
Royal Farms #96
Constant Rate Pumping Test
January 13th, 2012
Drawdown Vs. Time For RW-13 (Extraction Well)



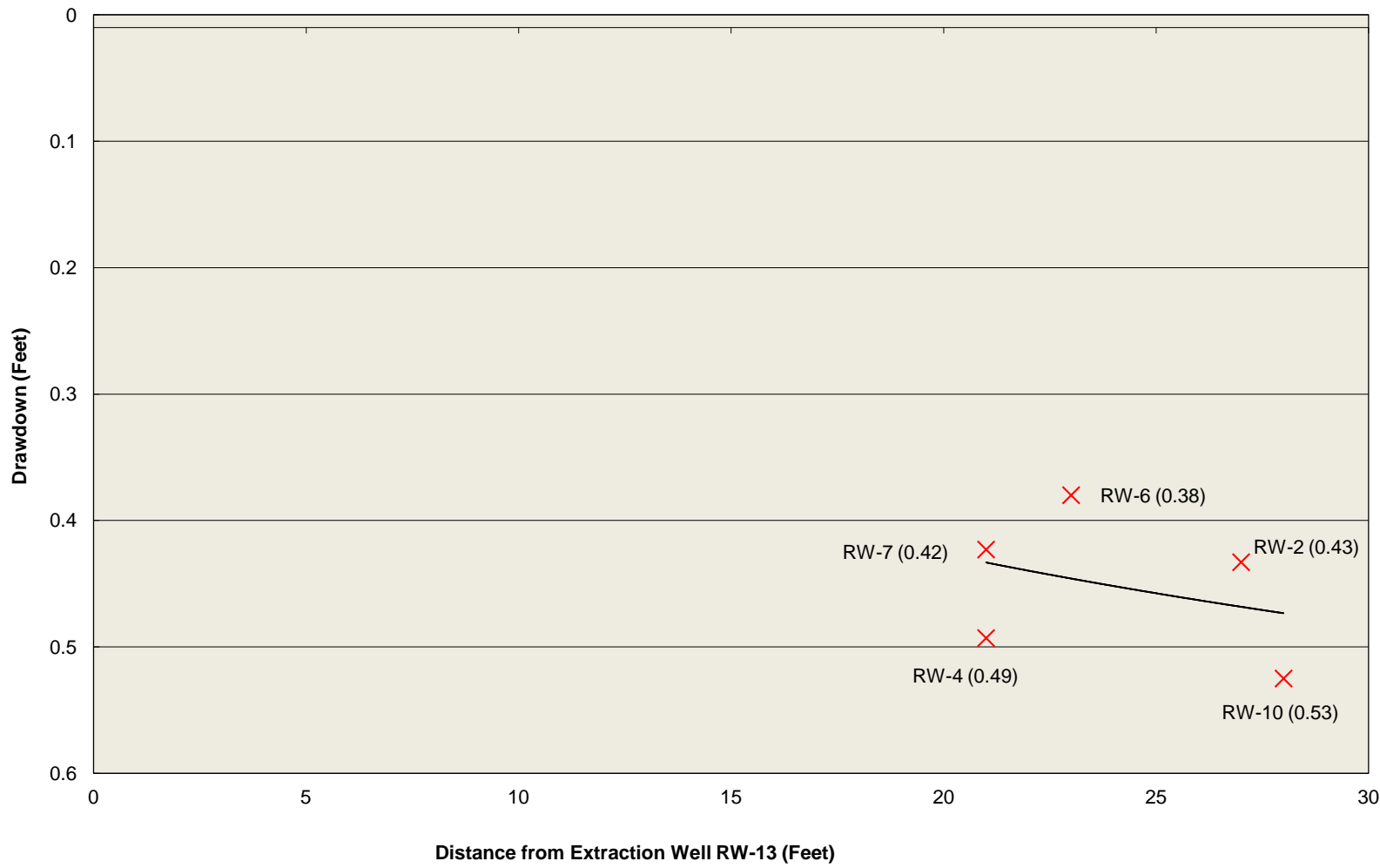
Graph 3
Royal Farms #96
Constant Rate Pumping Test (RW-13)
January 13th, 2012
Drawdown Vs. Distance at End of Test



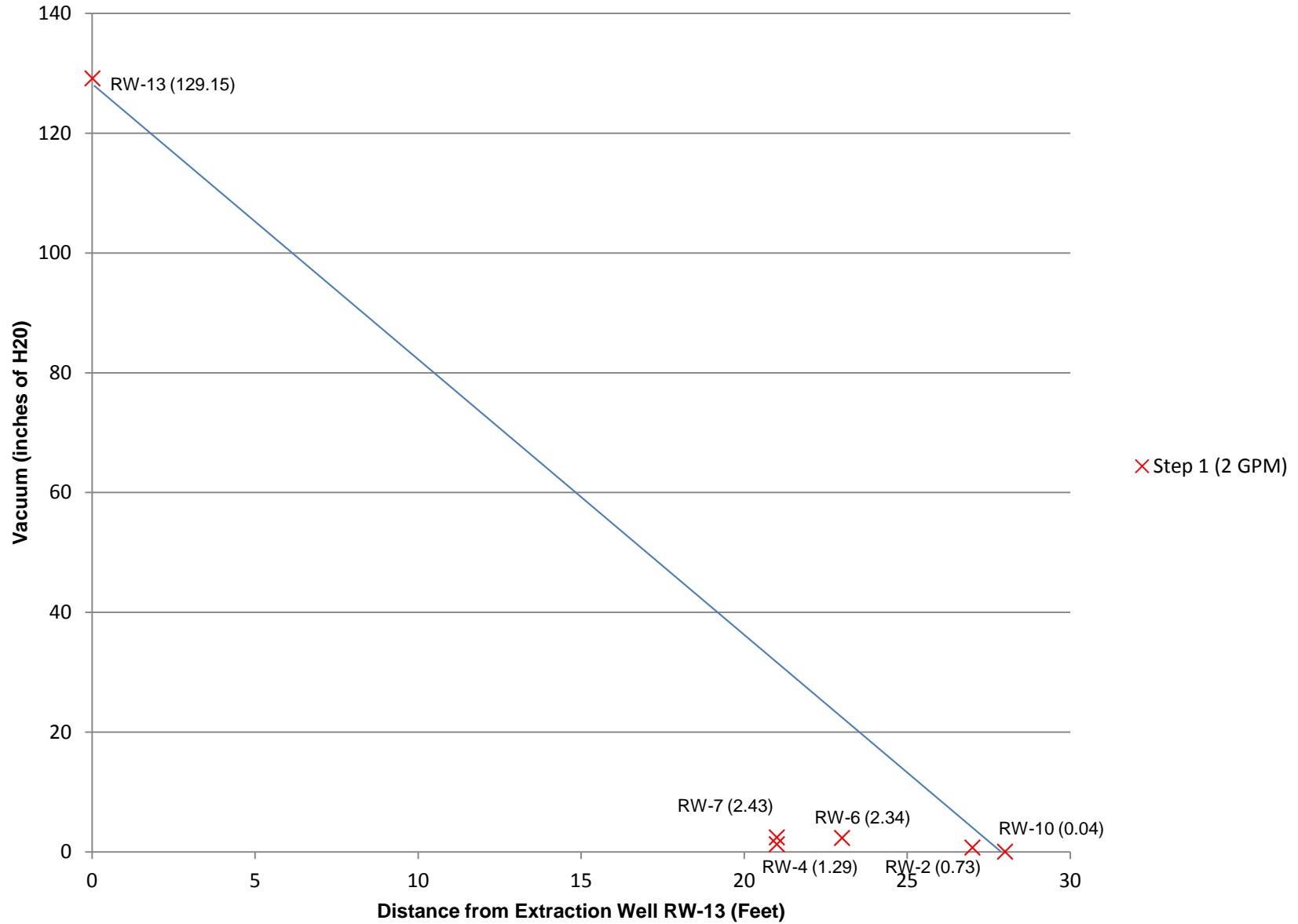
Graph 4
Royal Farms #96
Step Test Recovery - January 16th, 2012
Drawdown Vs. Time For RW-2, RW-4, RW-6, RW-7, and RW-10



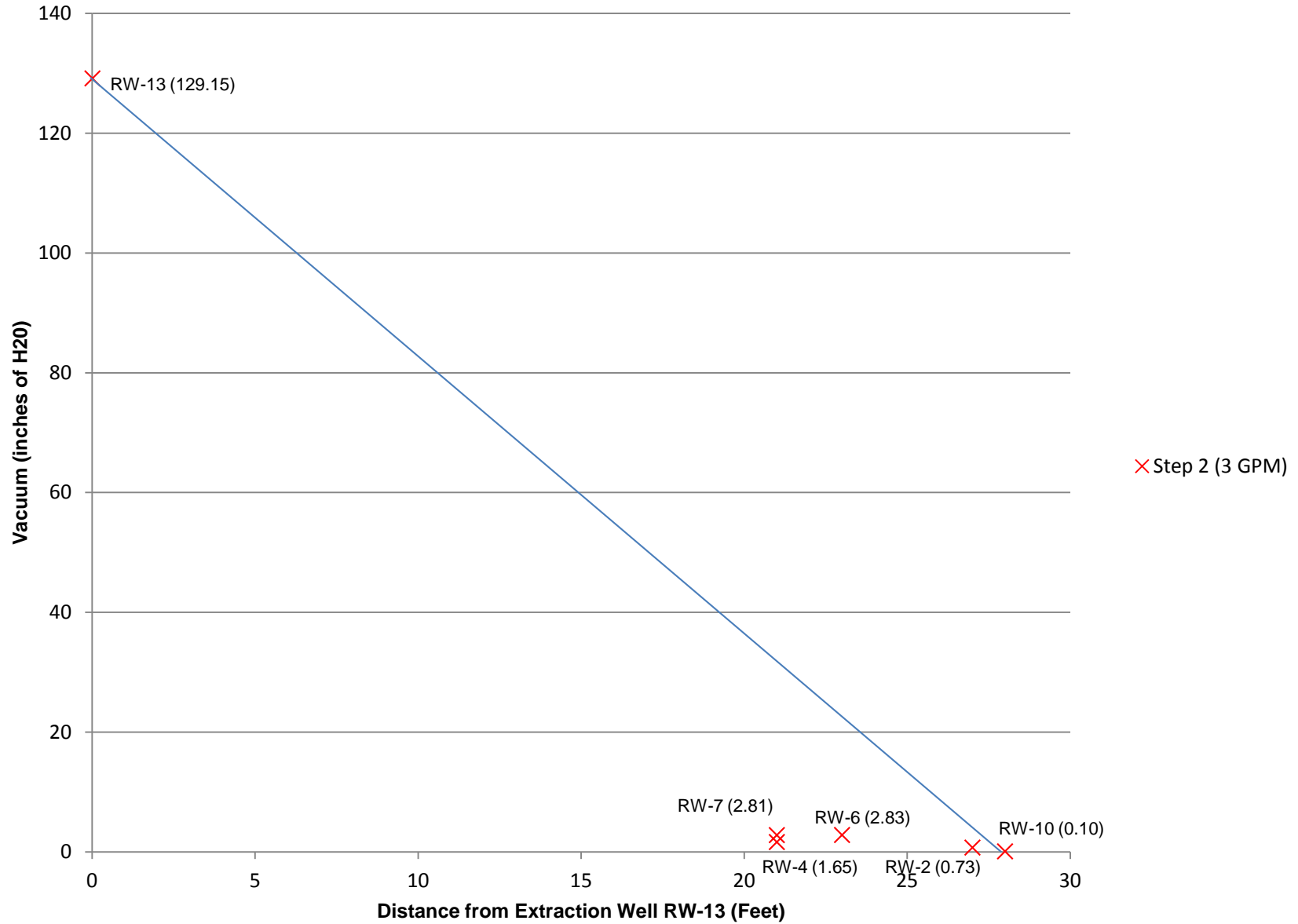
Graph 5
Royal Farms #96
Modified Step Drawdown Test (RW-13) - January 12th, 2012
Maximum Drawdown Vs. Distance at End of Test



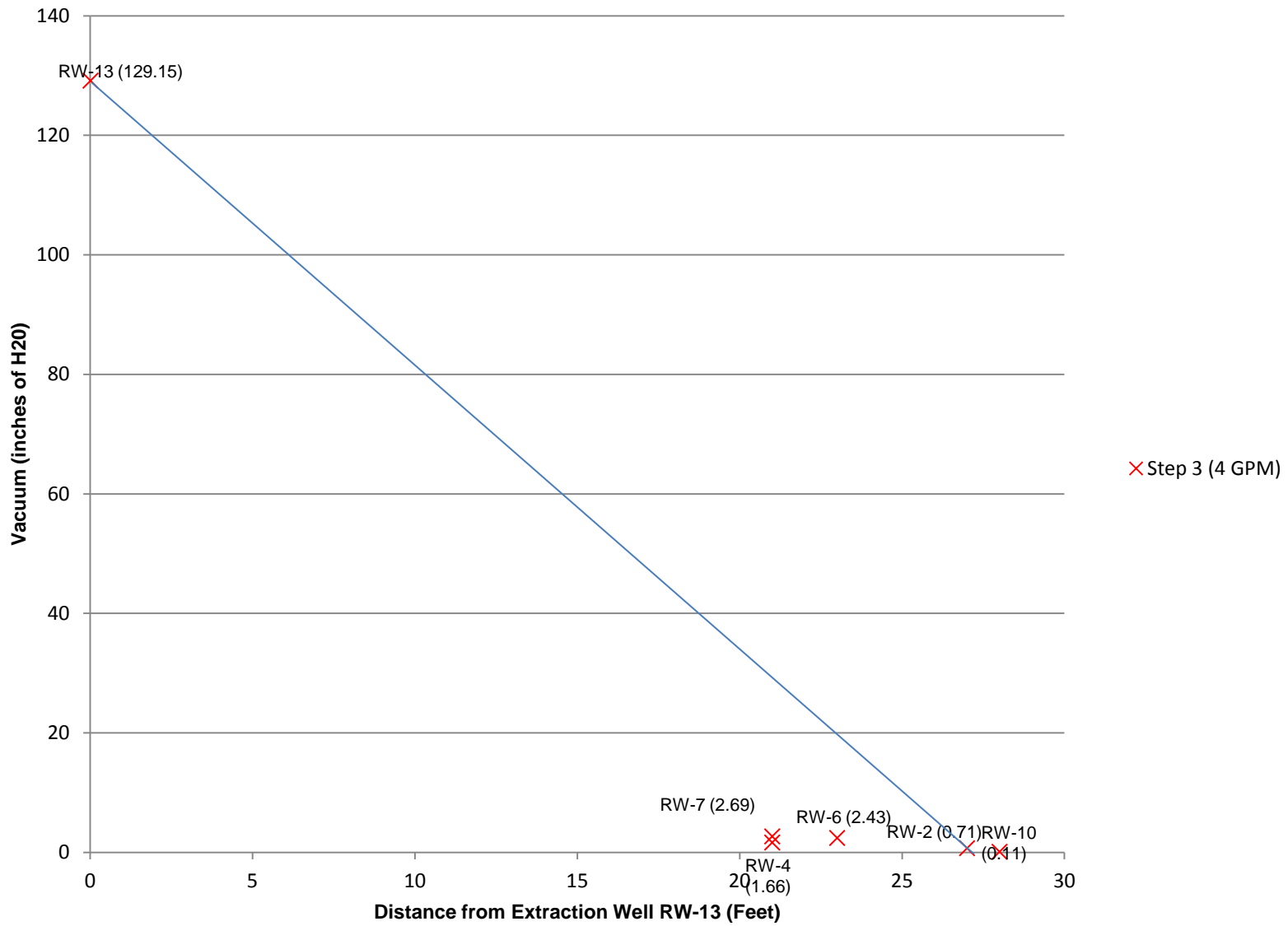
Graph 6
Royal Farms #96
Modified Step Drawdown Test - January 16th, 2012
Vacuum Vs. Distance For Step 1 (2 Gallons Per Minute)



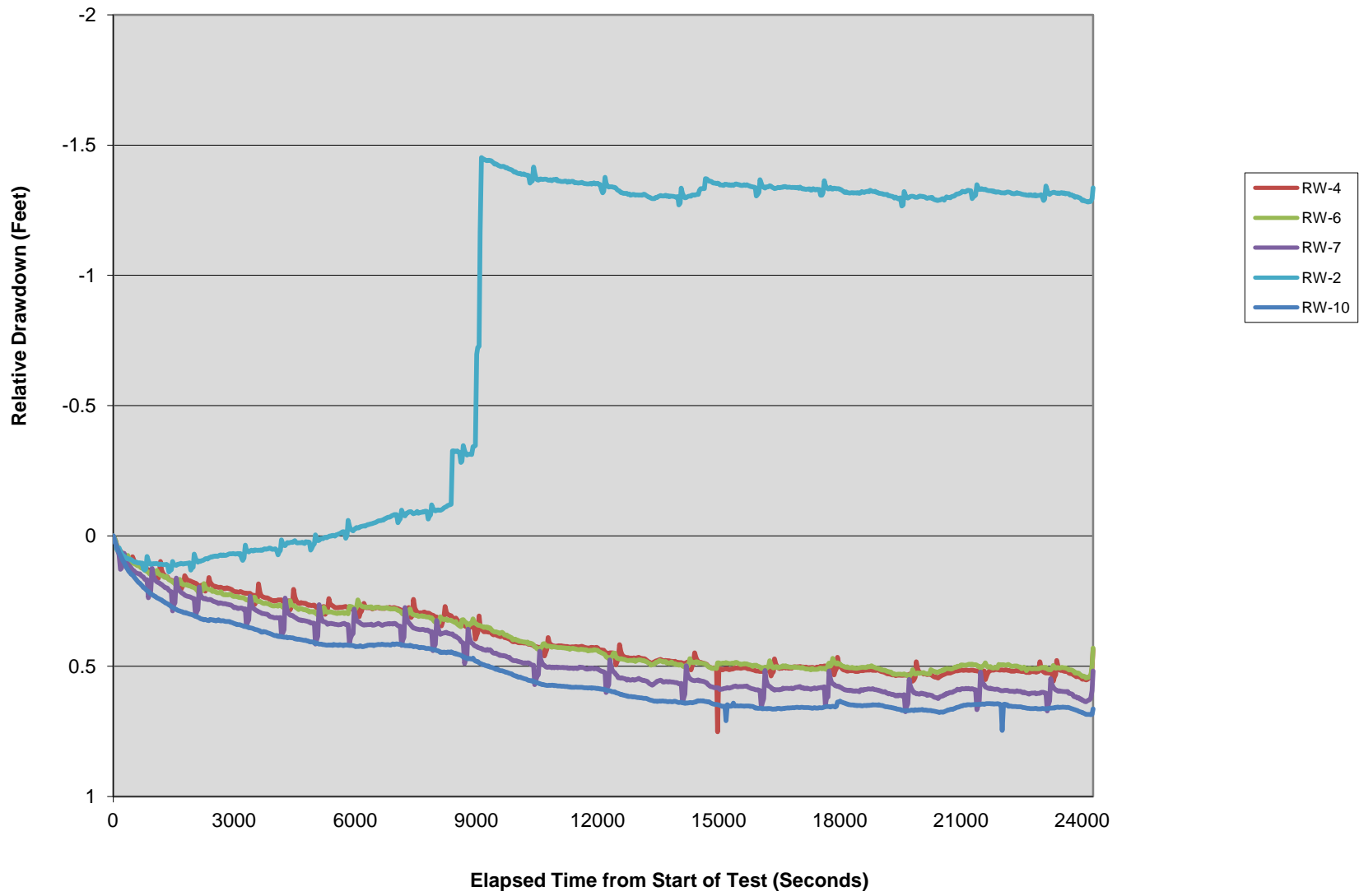
Graph 7
Royal Farms #96
Modified Step Drawdown Test - January 16th, 2012
Vacuum Vs. Distance For Step 2 (3 Gallons Per Minute)



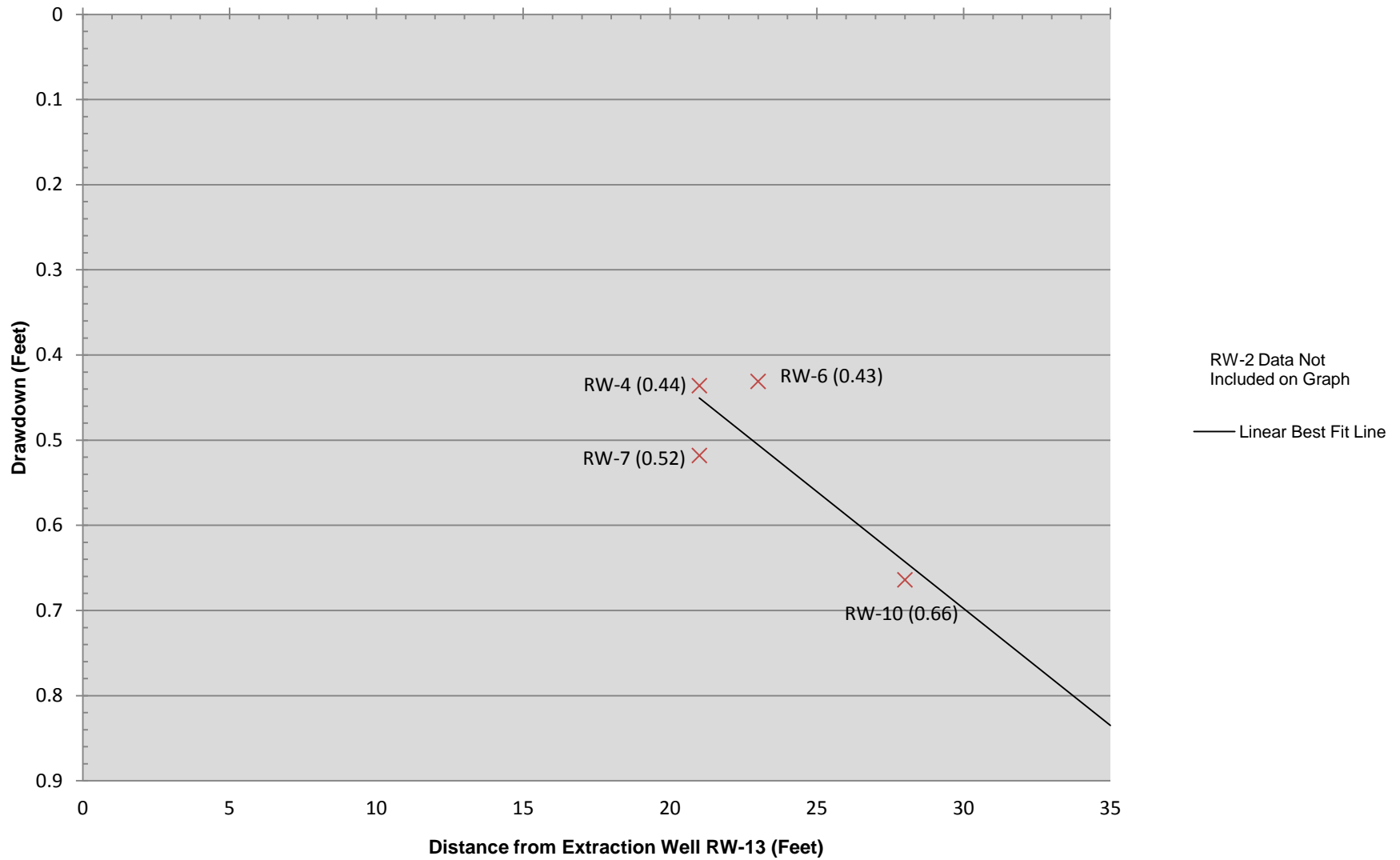
Graph 8
Royal Farms #96
Modified Step Drawdown Test - January 16th, 2012
Vacuum Vs. Distance For Step 3 (4 Gallons Per Minute)



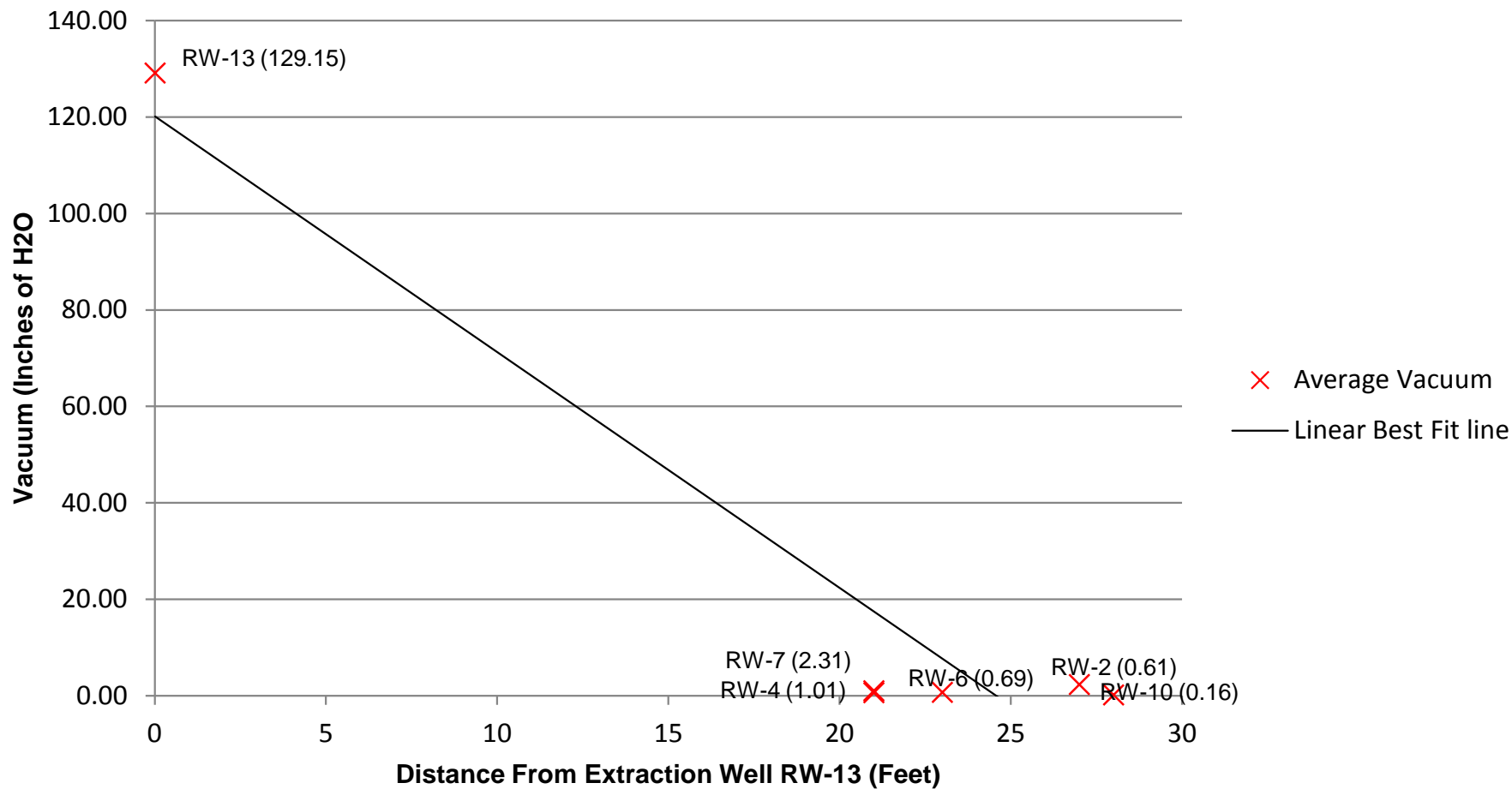
Graph 9
Royal Farms #96
Dual Phase Recovery Test - January 16th, 2012
Drawdown Vs. Time For RW-2, RW-4, RW-6, RW-7, and RW-10



Graph 10
Royal Farms #96
Dual Phase Recovery Test (RW-13) - January 16th, 2012
Drawdown Vs Distance at End of Test



Graph 11
Royal Farms #96
Dual Phase Recovery Test - January 16, 2012
Vacuum Vs. Distance (3 Gallons Per Minute)



APPENDIX D

Table 1
Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
0	0	0	0	0	0	0
30	0.52	0.117	0.117	0.099	-0.001	0.087
60	4.36	0.135	0.136	0.119	0.01	0.095
90	6.24	0.143	0.146	0.129	0.016	0.101
120	6.35	0.149	0.158	0.128	0.027	0.11
150	6.33	0.153	0.16	0.133	0.032	0.112
180	6.35	0.156	0.165	0.138	0.037	0.119
210	6.29	0.155	0.167	0.143	0.039	0.124
240	6.35	0.156	0.166	0.139	0.039	0.128
270	6	0.159	0.165	0.14	0.041	0.131
300	5.82	0.16	0.168	0.139	0.041	0.136
330	5.94	0.16	0.17	0.143	0.043	0.136
360	6.41	0.162	0.168	0.144	0.044	0.14
390	6.41	0.158	0.174	0.144	0.048	0.147
420	6.41	0.163	0.176	0.146	0.046	0.143
450	6.39	0.164	0.177	0.147	0.051	0.145
480	6.45	0.167	0.178	0.147	0.052	0.149
510	6.41	0.169	0.176	0.148	0.055	0.15
540	6.43	0.168	0.181	0.151	0.053	0.153
570	5.84	0.169	0.182	0.15	0.053	0.155
600	6.49	0.169	0.183	0.16	0.058	0.154
630	6.49	0.17	0.181	0.151	0.06	0.152
660	6.43	0.17	0.184	0.153	0.054	0.158
690	6.33	0.172	0.187	0.149	0.056	0.162
720	6.47	0.172	0.184	0.152	0.059	0.161
750	6.41	0.174	0.185	0.153	0.06	0.167
780	6.49	0.172	0.185	0.153	0.057	0.163
810	6.47	0.176	0.185	0.152	0.06	0.164
840	6.45	0.176	0.188	0.156	0.059	0.164
870	6.41	0.174	0.19	0.157	0.06	0.167
900	6.45	0.178	0.188	0.155	0.06	0.166
930	6.18	0.176	0.189	0.154	0.056	0.171
960	6.47	0.177	0.192	0.151	0.059	0.172
990	6.43	0.175	0.191	0.16	0.059	0.167
1020	6.49	0.176	0.19	0.155	0.066	0.173
1050	6.49	0.174	0.187	0.157	0.063	0.174
1080	6.47	0.179	0.19	0.158	0.058	0.172
1110	6.43	0.178	0.191	0.16	0.064	0.176
1140	6.41	0.178	0.193	0.158	0.075	0.172
1170	6.49	0.178	0.191	0.158	0.066	0.174
1200	6.45	0.177	0.192	0.16	0.065	0.172
1230	6.49	0.18	0.194	0.161	0.061	0.174
1260	6.49	0.178	0.193	0.16	0.065	0.177
1290	6.43	0.18	0.196	0.16	0.067	0.177
1320	6.41	0.183	0.195	0.164	0.066	0.176
1350	6.31	0.183	0.198	0.164	0.067	0.178
1380	6.31	0.181	0.199	0.164	0.066	0.179
1410	6.37	0.184	0.199	0.166	0.07	0.18

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
1440	6.31	0.184	0.198	0.166	0.073	0.18
1470	6.2	0.186	0.201	0.169	0.073	0.178
1500	6.37	0.185	0.2	0.166	0.073	0.183
1530	6.26	0.187	0.2	0.17	0.073	0.18
1560	6.35	0.185	0.202	0.168	0.074	0.18
1590	6.31	0.187	0.202	0.172	0.077	0.179
1620	6.37	0.186	0.202	0.17	0.072	0.181
1650	6.33	0.19	0.202	0.172	0.076	0.186
1680	6.14	0.187	0.202	0.176	0.08	0.185
1710	6.35	0.188	0.202	0.175	0.075	0.183
1740	6.37	0.19	0.203	0.171	0.072	0.188
1770	6.37	0.191	0.205	0.172	0.078	0.187
1800	6.31	0.19	0.203	0.17	0.08	0.187
1830	6.39	0.189	0.203	0.168	0.075	0.186
1860	6.33	0.191	0.205	0.167	0.077	0.19
1890	6.39	0.189	0.203	0.171	0.077	0.189
1920	6.33	0.19	0.205	0.17	0.07	0.189
1950	6.37	0.193	0.208	0.177	0.076	0.193
1980	6.37	0.192	0.207	0.169	0.074	0.191
2010	6.35	0.193	0.207	0.173	0.077	0.19
2040	6.35	0.195	0.209	0.174	0.075	0.191
2070	6.29	0.195	0.208	0.179	0.076	0.192
2100	6.33	0.198	0.209	0.175	0.074	0.192
2130	6.2	0.194	0.211	0.181	0.077	0.19
2160	6.35	0.195	0.21	0.172	0.076	0.193
2190	6.35	0.193	0.211	0.176	0.072	0.191
2220	6.39	0.193	0.21	0.176	0.08	0.195
2250	6.39	0.194	0.208	0.178	0.086	0.193
2280	6.39	0.193	0.21	0.181	0.09	0.193
2310	6.31	0.191	0.208	0.177	0.091	0.191
2340	5.88	0.195	0.21	0.178	0.085	0.191
2370	6.39	0.193	0.208	0.18	0.089	0.195
2400	6.41	0.19	0.208	0.184	0.09	0.192
2430	6.29	0.193	0.209	0.177	0.089	0.192
2460	6.35	0.193	0.21	0.182	0.067	0.192
2490	6.39	0.195	0.209	0.179	0.069	0.192
2520	6.12	0.195	0.21	0.184	0.069	0.194
2550	6.39	0.193	0.206	0.186	0.068	0.194
2580	6.29	0.194	0.211	0.181	0.065	0.195
2610	6.37	0.192	0.212	0.179	0.073	0.195
2640	6.39	0.197	0.214	0.182	0.07	0.194
2670	6.06	0.196	0.214	0.184	0.076	0.196
2700	6.41	0.194	0.211	0.181	0.062	0.196
2730	6.29	0.19	0.208	0.178	0.07	0.198
2760	6.33	0.19	0.204	0.175	0.064	0.193
2790	6.33	0.19	0.207	0.178	0.068	0.194
2820	6.31	0.191	0.208	0.178	0.069	0.191
2850	6.31	0.192	0.208	0.18	0.07	0.19
2880	6.39	0.192	0.208	0.183	0.069	0.189

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
2910	6.02	0.194	0.208	0.18	0.068	0.191
2940	6.26	0.196	0.209	0.178	0.068	0.193
2970	6.39	0.195	0.209	0.182	0.068	0.196
3000	6.37	0.197	0.208	0.179	0.069	0.192
3030	6.41	0.196	0.21	0.181	0.072	0.196
3060	6.39	0.193	0.21	0.182	0.072	0.194
3090	6.29	0.196	0.209	0.182	0.073	0.194
3120	6.33	0.202	0.213	0.186	0.074	0.194
3150	6.39	0.202	0.214	0.185	0.071	0.197
3180	6.39	0.202	0.214	0.184	0.071	0.196
3210	6.29	0.201	0.212	0.187	0.073	0.198
3240	6.29	0.201	0.213	0.185	0.07	0.197
3270	6.31	0.2	0.21	0.188	0.07	0.198
3300	6.33	0.201	0.211	0.183	0.076	0.198
3330	6.39	0.202	0.212	0.19	0.069	0.195
3360	6.1	0.2	0.212	0.186	0.074	0.198
3390	6.29	0.2	0.212	0.184	0.072	0.201
3420	6.31	0.202	0.214	0.187	0.07	0.199
3450	6.41	0.202	0.215	0.188	0.075	0.203
3480	6.31	0.205	0.214	0.187	0.071	0.201
3510	6.41	0.201	0.214	0.182	0.075	0.205
3540	6.35	0.197	0.214	0.187	0.075	0.202
3570	6.41	0.198	0.214	0.183	0.068	0.198
3600	6.37	0.202	0.216	0.181	0.07	0.201
3630	6.35	0.201	0.216	0.183	0.071	0.203
3660	6.41	0.2	0.214	0.182	0.068	0.202
3690	6.29	0.2	0.214	0.181	0.072	0.204
3720	6.33	0.205	0.217	0.188	0.073	0.202
3750	6.35	0.206	0.217	0.187	0.072	0.203
3780	6.39	0.203	0.217	0.189	0.077	0.204
3810	6.33	0.206	0.216	0.189	0.073	0.205
3840	6.35	0.204	0.217	0.188	0.076	0.204
3870	6.29	0.204	0.218	0.194	0.071	0.201
3900	6.47	0.206	0.217	0.185	0.071	0.204
3930	6.2	0.203	0.218	0.191	0.076	0.204
3960	6.06	0.204	0.218	0.186	0.072	0.203
3990	6.37	0.206	0.217	0.19	0.075	0.21
4020	6.39	0.206	0.22	0.188	0.075	0.203
4050	6.37	0.206	0.219	0.19	0.075	0.205
4080	6.37	0.205	0.216	0.186	0.074	0.205
4110	6.37	0.201	0.215	0.184	0.074	0.203
4140	6.33	0.202	0.215	0.184	0.07	0.202
4170	6.37	0.205	0.213	0.183	0.067	0.204
4200	6.37	0.203	0.212	0.186	0.07	0.207
4230	6.22	0.205	0.215	0.185	0.07	0.207
4260	5.46	0.204	0.214	0.189	0.073	0.204
4290	6.24	0.206	0.217	0.182	0.071	0.21
4320	6.39	0.205	0.215	0.185	0.077	0.207
4350	6.31	0.204	0.218	0.189	0.076	0.203

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
4380	6.31	0.205	0.213	0.189	0.077	0.205
4410	6.35	0.203	0.214	0.187	0.073	0.207
4440	6.31	0.204	0.216	0.187	0.078	0.205
4470	6.35	0.205	0.215	0.189	0.076	0.204
4500	6.39	0.202	0.217	0.181	0.074	0.205
4530	6.35	0.202	0.215	0.187	0.075	0.206
4560	6.39	0.203	0.214	0.189	0.073	0.204
4590	6.33	0.205	0.216	0.195	0.073	0.207
4620	6.37	0.206	0.218	0.189	0.072	0.21
4650	6.41	0.205	0.215	0.188	0.071	0.21
4680	6.39	0.206	0.218	0.188	0.07	0.209
4710	6.31	0.208	0.218	0.19	0.072	0.207
4740	6.31	0.203	0.218	0.196	0.073	0.21
4770	6.33	0.207	0.218	0.185	0.071	0.208
4800	6.37	0.208	0.216	0.192	0.071	0.213
4830	6.33	0.208	0.22	0.188	0.071	0.21
4860	6.31	0.209	0.22	0.187	0.072	0.21
4890	6.33	0.208	0.219	0.187	0.074	0.209
4920	6.37	0.207	0.22	0.196	0.075	0.21
4950	6.33	0.207	0.218	0.194	0.076	0.207
4980	6.35	0.205	0.218	0.193	0.074	0.209
5010	6.41	0.207	0.221	0.192	0.075	0.207
5040	6.37	0.21	0.22	0.193	0.076	0.212
5070	6.35	0.209	0.221	0.194	0.073	0.21
5100	6.39	0.21	0.221	0.193	0.074	0.208
5130	6.41	0.21	0.218	0.193	0.072	0.21
5160	6.29	0.208	0.22	0.192	0.07	0.21
5190	6.35	0.207	0.221	0.19	0.072	0.21
5220	6.31	0.208	0.221	0.187	0.065	0.21
5250	6.33	0.209	0.219	0.19	0.072	0.209
5280	6.35	0.208	0.219	0.191	0.07	0.209
5310	6.31	0.208	0.22	0.189	0.068	0.208
5340	6.37	0.207	0.217	0.192	0.069	0.209
5370	6.33	0.209	0.219	0.189	0.065	0.209
5400	6.39	0.209	0.222	0.184	0.073	0.211
5430	6.33	0.211	0.221	0.19	0.067	0.207
5460	6.37	0.21	0.222	0.192	0.069	0.209
5490	6.33	0.209	0.224	0.194	0.069	0.21
5520	6.33	0.207	0.222	0.186	0.065	0.212
5550	6.39	0.211	0.222	0.195	0.071	0.209
5580	6.35	0.209	0.223	0.19	0.069	0.208
5610	6.39	0.211	0.223	0.186	0.067	0.21
5640	6.35	0.211	0.223	0.188	0.064	0.209
5670	6.33	0.21	0.222	0.191	0.065	0.21
5700	6.39	0.211	0.221	0.194	0.068	0.212
5730	6.39	0.214	0.225	0.192	0.066	0.212
5760	6.31	0.213	0.225	0.19	0.063	0.211
5790	6.31	0.216	0.225	0.189	0.067	0.213
5820	6.35	0.217	0.226	0.189	0.067	0.212

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
5850	6.39	0.217	0.228	0.189	0.064	0.213
5880	6.33	0.218	0.227	0.189	0.063	0.217
5910	6.31	0.216	0.227	0.187	0.053	0.215
5940	6.29	0.218	0.225	0.188	0.057	0.216
5970	6.31	0.217	0.223	0.191	0.056	0.213
6000	6.39	0.218	0.228	0.193	0.059	0.214
6030	6.37	0.217	0.228	0.193	0.057	0.214
6060	6.37	0.218	0.227	0.192	0.055	0.217
6090	6.35	0.216	0.23	0.193	0.056	0.216
6120	6.41	0.22	0.231	0.194	0.056	0.216
6150	6.37	0.22	0.231	0.198	0.055	0.217
6180	6.31	0.217	0.229	0.195	0.056	0.22
6210	6.35	0.215	0.23	0.196	0.056	0.218
6240	6.31	0.218	0.229	0.194	0.054	0.219
6270	6.31	0.219	0.229	0.197	0.057	0.217
6300	6.31	0.218	0.228	0.199	0.056	0.217
6330	6.29	0.219	0.23	0.198	0.053	0.217
6360	6.39	0.219	0.229	0.196	0.054	0.218
6390	6.31	0.216	0.229	0.196	0.054	0.218
6420	6.29	0.218	0.23	0.196	0.055	0.216
6450	6.39	0.219	0.23	0.2	0.057	0.216
6480	6.55	0.22	0.232	0.195	0.056	0.219
6510	6.45	0.22	0.23	0.201	0.062	0.218
6540	6.2	0.22	0.231	0.197	0.061	0.218
6570	6.33	0.22	0.231	0.196	0.061	0.217
6600	6.33	0.22	0.23	0.2	0.062	0.22
6630	6.33	0.218	0.228	0.199	0.061	0.218
6660	6.29	0.218	0.228	0.198	0.062	0.218
6690	6.31	0.219	0.229	0.198	0.058	0.222
6720	6.37	0.219	0.231	0.199	0.057	0.219
6750	6.35	0.22	0.23	0.2	0.061	0.219
6780	6.35	0.22	0.232	0.201	0.066	0.218
6810	6.33	0.222	0.234	0.199	0.064	0.218
6840	6.31	0.222	0.233	0.2	0.062	0.219
6870	6.39	0.222	0.231	0.197	0.066	0.22
6900	6.33	0.221	0.235	0.197	0.06	0.219
6930	6.39	0.22	0.234	0.202	0.062	0.221
6960	7.95	0.221	0.234	0.202	0.064	0.221
6990	6.22	0.222	0.232	0.199	0.065	0.222
7020	6.29	0.222	0.231	0.2	0.06	0.222
7050	6.31	0.225	0.234	0.2	0.063	0.221
7080	6.31	0.222	0.237	0.197	0.063	0.222
7110	6.39	0.222	0.235	0.201	0.062	0.221
7140	6.31	0.222	0.235	0.2	0.06	0.222
7170	6.31	0.222	0.235	0.203	0.06	0.222
7200	6.41	0.222	0.236	0.201	0.062	0.223
7230	6.35	0.227	0.237	0.2	0.057	0.224
7260	6.35	0.224	0.238	0.202	0.059	0.222
7290	6.41	0.225	0.237	0.2	0.059	0.224

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
7320	6.41	0.23	0.238	0.198	0.061	0.225
7350	6.39	0.23	0.239	0.201	0.062	0.225
7380	6.35	0.23	0.242	0.203	0.058	0.227
7410	6.14	0.232	0.24	0.202	0.056	0.225
7440	6.67	0.233	0.243	0.2	0.06	0.229
7470	6.26	0.234	0.243	0.203	0.06	0.228
7500	6.41	0.231	0.243	0.201	0.059	0.228
7530	6.39	0.23	0.245	0.2	0.058	0.227
7560	6.39	0.231	0.242	0.203	0.058	0.228
7590	6.41	0.233	0.241	0.199	0.056	0.229
7620	6.39	0.234	0.243	0.202	0.056	0.231
7650	6.41	0.231	0.24	0.202	0.056	0.231
7680	6.31	0.231	0.242	0.198	0.058	0.23
7710	6.41	0.229	0.241	0.195	0.056	0.228
7740	6.39	0.23	0.243	0.195	0.052	0.229
7770	6.31	0.232	0.242	0.202	0.052	0.229
7800	6.39	0.232	0.243	0.196	0.051	0.232
7830	6.31	0.231	0.244	0.197	0.052	0.232
7860	6.31	0.232	0.245	0.198	0.051	0.23
7890	6.31	0.235	0.246	0.194	0.052	0.229
7920	6.39	0.234	0.243	0.197	0.046	0.234
7950	6.31	0.234	0.246	0.199	0.049	0.232
7980	6.33	0.236	0.246	0.198	0.049	0.232
8010	6.39	0.237	0.247	0.2	0.053	0.231
8040	6.29	0.236	0.246	0.199	0.052	0.23
8070	6.35	0.236	0.245	0.195	0.049	0.233
8100	6.33	0.239	0.247	0.197	0.047	0.233
8130	6.39	0.237	0.248	0.194	0.05	0.237
8160	6.02	0.234	0.246	0.194	0.04	0.236
8190	6.33	0.233	0.24	0.187	0.047	0.238
8220	6.67	0.232	0.241	0.187	0.045	0.234
8250	6.35	0.231	0.237	0.189	0.042	0.233
8280	6.37	0.229	0.241	0.19	0.038	0.233
8310	6.31	0.232	0.243	0.189	0.042	0.234
8340	6.33	0.234	0.242	0.185	0.04	0.232
8370	6.39	0.233	0.242	0.187	0.045	0.231
8400	6.29	0.234	0.24	0.188	0.041	0.231
8430	6.33	0.232	0.243	0.187	0.041	0.235
8460	6.26	0.234	0.242	0.19	0.039	0.235
8490	6.39	0.232	0.242	0.192	0.042	0.233
8520	6.39	0.234	0.245	0.188	0.037	0.234
8550	6.31	0.235	0.245	0.192	0.04	0.232
8580	6.35	0.236	0.245	0.19	0.04	0.232
8610	6.31	0.237	0.247	0.191	0.04	0.237
8640	6.33	0.237	0.248	0.192	0.041	0.235
8670	6.39	0.238	0.247	0.191	0.041	0.234
8700	6.41	0.238	0.246	0.189	0.041	0.235
8730	6.41	0.237	0.248	0.19	0.039	0.232
8760	6.31	0.239	0.251	0.191	0.04	0.237

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
8790	6.39	0.237	0.248	0.189	0.039	0.235
8820	6.29	0.241	0.248	0.192	0.039	0.237
8850	6.35	0.238	0.249	0.188	0.038	0.237
8880	6.39	0.238	0.248	0.19	0.038	0.236
8910	6.29	0.238	0.248	0.19	0.036	0.235
8940	6.02	0.24	0.249	0.187	0.038	0.237
8970	5.72	0.238	0.249	0.188	0.036	0.237
9000	6.41	0.24	0.249	0.186	0.034	0.237
9030	6.33	0.239	0.249	0.192	0.038	0.236
9060	6.31	0.237	0.248	0.19	0.036	0.236
9090	6.39	0.238	0.247	0.194	0.039	0.236
9120	6.35	0.235	0.244	0.189	0.036	0.238
9150	6.31	0.237	0.246	0.187	0.035	0.237
9180	6.39	0.237	0.246	0.192	0.035	0.238
9210	6.41	0.239	0.247	0.186	0.039	0.236
9240	6.29	0.238	0.245	0.189	0.036	0.237
9270	6.41	0.237	0.249	0.186	0.041	0.238
9300	6.35	0.237	0.244	0.19	0.036	0.235
9330	6.35	0.239	0.245	0.187	0.037	0.241
9360	6.39	0.24	0.247	0.189	0.037	0.237
9390	6.31	0.241	0.247	0.194	0.032	0.239
9420	6.33	0.237	0.248	0.185	0.04	0.242
9450	6.41	0.238	0.25	0.193	0.042	0.238
9480	6.37	0.241	0.249	0.187	0.035	0.237
9510	6.41	0.24	0.253	0.188	0.038	0.239
9540	6.31	0.242	0.252	0.191	0.04	0.24
9570	6.37	0.242	0.252	0.188	0.036	0.241
9600	6.31	0.244	0.252	0.189	0.04	0.24
9630	6.35	0.242	0.251	0.189	0.037	0.241
9660	6.31	0.245	0.252	0.189	0.041	0.242
9690	6.35	0.24	0.252	0.183	0.04	0.238
9720	6.39	0.243	0.251	0.185	0.037	0.239
9750	6.35	0.242	0.252	0.188	0.038	0.243
9780	6.35	0.242	0.25	0.192	0.035	0.24
9810	6.39	0.242	0.25	0.191	0.032	0.24
9840	6.31	0.244	0.254	0.192	0.035	0.242
9870	6.39	0.242	0.251	0.19	0.035	0.242
9900	6.31	0.243	0.248	0.191	0.037	0.242
9930	6.31	0.242	0.251	0.193	0.028	0.238
9960	6.41	0.242	0.253	0.188	0.029	0.243
9990	6.24	0.245	0.252	0.188	0.04	0.241
10020	6.39	0.245	0.253	0.186	0.044	0.242
10050	6.31	0.245	0.255	0.186	0.042	0.241
10080	6.39	0.245	0.256	0.189	0.039	0.243
10110	6.37	0.246	0.255	0.19	0.027	0.242
10140	6.37	0.247	0.258	0.186	0.027	0.243
10170	6.37	0.248	0.253	0.188	0.029	0.244
10200	6.29	0.251	0.253	0.188	0.028	0.244
10230	6.29	0.248	0.257	0.187	0.029	0.245

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
10260	6.39	0.249	0.251	0.187	0.031	0.245
10290	6.31	0.248	0.255	0.186	0.025	0.244
10320	6.39	0.248	0.26	0.188	0.029	0.244
10350	6.37	0.251	0.259	0.193	0.026	0.243
10380	6.31	0.249	0.258	0.198	0.03	0.246
10410	6.41	0.248	0.257	0.196	0.031	0.244
10440	6.29	0.307	0.256	0.196	0.027	0.245
10470	6.31	0.249	0.255	0.2	0.028	0.245
10500	6.29	0.249	0.259	0.194	0.028	0.246
10530	6.29	0.253	0.259	0.2	0.031	0.248
10560	6.37	0.251	0.263	0.194	0.029	0.244
10590	6.33	0.25	0.261	0.196	0.024	0.245
10620	6.29	0.251	0.259	0.192	0.023	0.243
10650	6.37	0.25	0.262	0.195	0.019	0.247
10680	6.31	0.252	0.264	0.194	0.027	0.246
10710	6.71	0.251	0.26	0.195	0.023	0.237
10740	6.35	0.252	0.261	0.195	0.025	0.239
10770	6.37	0.251	0.262	0.197	0.024	0.239
10800	6.29	0.254	0.265	0.195	0.024	0.24
10830	6.35	0.254	0.263	0.196	0.026	0.243
10860	6.26	0.256	0.266	0.198	0.025	0.241
10890	6.37	0.255	0.264	0.197	0.023	0.243
10920	6.29	0.252	0.264	0.193	0.022	0.242
10950	6.31	0.254	0.265	0.193	0.021	0.242
10980	6.26	0.255	0.266	0.193	0.019	0.243
11010	6.26	0.253	0.266	0.196	0.021	0.242
11040	6.26	0.253	0.265	0.196	0.023	0.241
11070	6.37	0.256	0.265	0.193	0.018	0.242
11100	6.26	0.255	0.264	0.193	0.02	0.243
11130	6.37	0.257	0.269	0.194	0.019	0.243
11160	6.33	0.256	0.265	0.188	0.019	0.244
11190	6.37	0.259	0.266	0.195	0.017	0.243
11220	6.31	0.262	0.268	0.196	0.016	0.244
11250	6.26	0.262	0.27	0.191	0.015	0.245
11280	6.33	0.264	0.272	0.186	0.026	0.249
11310	6.35	0.263	0.271	0.201	0.019	0.242
11340	6.37	0.263	0.273	0.197	0.012	0.247
11370	6.29	0.263	0.271	0.194	0.012	0.247
11400	6.37	0.263	0.271	0.197	0.012	0.247
11430	6.31	0.263	0.274	0.195	0.011	0.253
11460	6.33	0.266	0.275	0.188	0.01	0.25
11490	6.33	0.266	0.273	0.197	0.012	0.251
11520	6.29	0.263	0.272	0.198	0.014	0.253
11550	6.37	0.264	0.273	0.197	0.012	0.252
11580	6.29	0.266	0.275	0.201	0.017	0.253
11610	6.37	0.265	0.272	0.203	0.014	0.249
11640	6.35	0.265	0.273	0.199	0.016	0.254
11670	6.16	0.264	0.273	0.208	0.012	0.25
11700	6.2	0.263	0.273	0.2	0.014	0.253

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
11730	6.14	0.264	0.273	0.197	0.014	0.252
11760	6.12	0.265	0.274	0.195	0.012	0.253
11790	6.37	0.265	0.274	0.194	0.013	0.253
11820	6.31	0.265	0.272	0.199	0.013	0.253
11850	6.33	0.265	0.273	0.199	0.015	0.253
11880	6.33	0.263	0.272	0.196	0.008	0.252
11910	6.39	0.264	0.272	0.196	0.009	0.255
11940	6.35	0.266	0.276	0.193	0.009	0.253
11970	6.33	0.264	0.273	0.194	0.006	0.252
12000	6.37	0.266	0.274	0.197	0.007	0.255
12030	6.31	0.264	0.271	0.195	0.008	0.253
12060	6.29	0.262	0.275	0.196	0.007	0.254
12090	6.39	0.265	0.274	0.196	0.007	0.254
12120	6.33	0.266	0.274	0.194	0.005	0.254
12150	6.39	0.266	0.273	0.192	0.004	0.255
12180	6.26	0.267	0.277	0.195	0.006	0.255
12210	6.33	0.267	0.276	0.198	0.006	0.255
12240	6.29	0.267	0.274	0.198	0.004	0.254
12270	6.35	0.268	0.276	0.193	0.007	0.258
12300	6.37	0.267	0.274	0.195	0.005	0.254
12330	6.37	0.266	0.276	0.193	0.005	0.257
12360	6.29	0.268	0.275	0.195	0.003	0.256
12390	6.33	0.27	0.274	0.194	0.007	0.256
12420	6.31	0.267	0.275	0.197	0.009	0.255
12450	6.22	0.268	0.275	0.196	0.007	0.257
12480	6.08	0.266	0.273	0.192	0.001	0.256
12510	6.1	0.267	0.274	0.191	0.005	0.255
12540	6.33	0.266	0.276	0.189	0.004	0.257
12570	6.33	0.266	0.274	0.195	-0.001	0.255
12600	6.29	0.265	0.276	0.192	0.004	0.259
12630	6.37	0.265	0.274	0.191	0.002	0.254
12660	6.35	0.265	0.272	0.189	-0.002	0.256
12690	6.26	0.266	0.276	0.192	0	0.256
12720	6.29	0.264	0.274	0.188	-0.004	0.254
12750	6.37	0.267	0.276	0.185	-0.003	0.258
12780	6.37	0.267	0.274	0.183	-0.004	0.256
12810	6.37	0.268	0.274	0.187	-0.009	0.256
12840	6.31	0.268	0.275	0.189	-0.007	0.257
12870	6.35	0.269	0.275	0.189	-0.011	0.256
12900	6.39	0.267	0.273	0.182	-0.008	0.258
12930	6.26	0.267	0.272	0.19	-0.009	0.256
12960	6.31	0.27	0.273	0.189	-0.017	0.255
12990	6.14	0.269	0.274	0.189	-0.016	0.259
13020	6.31	0.269	0.275	0.189	-0.01	0.255
13050	6.35	0.273	0.276	0.189	-0.013	0.259
13080	6.39	0.27	0.276	0.184	-0.007	0.258
13110	6.29	0.269	0.276	0.189	-0.012	0.254
13140	6.35	0.27	0.278	0.189	-0.007	0.255
13170	6.37	0.271	0.28	0.184	-0.016	0.255

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
13200	6.31	0.271	0.279	0.189	-0.015	0.26
13230	6.37	0.273	0.279	0.189	-0.015	0.26
13260	6.33	0.273	0.28	0.196	-0.013	0.259
13290	6.37	0.27	0.281	0.19	-0.015	0.26
13320	6.35	0.272	0.28	0.19	-0.017	0.259
13350	6.37	0.274	0.28	0.192	-0.016	0.261
13380	6.37	0.273	0.278	0.188	-0.023	0.261
13410	6.35	0.273	0.28	0.188	-0.021	0.265
13440	6.31	0.275	0.282	0.189	-0.018	0.26
13470	6.29	0.274	0.279	0.191	-0.02	0.26
13500	6.39	0.274	0.281	0.193	-0.019	0.263
13530	6.37	0.272	0.281	0.191	-0.022	0.262
13560	6.35	0.272	0.283	0.193	-0.019	0.26
13590	6.31	0.273	0.28	0.192	-0.02	0.259
13620	6.37	0.273	0.283	0.191	-0.021	0.262
13650	6.31	0.274	0.281	0.193	-0.021	0.263
13680	6.41	0.274	0.28	0.191	-0.022	0.262
13710	6.39	0.272	0.283	0.195	-0.018	0.26
13740	6.37	0.271	0.28	0.193	-0.02	0.263
13770	6	0.272	0.279	0.195	-0.02	0.261
13800	6.41	0.27	0.277	0.191	-0.024	0.263
13830	6.39	0.271	0.278	0.194	-0.022	0.261
13860	6.39	0.272	0.28	0.189	-0.027	0.262
13890	6.33	0.27	0.277	0.186	-0.025	0.261
13920	6.35	0.27	0.279	0.188	0	0.258
13950	6.35	0.271	0.28	0.187	0.005	0.266
13980	6.39	0.273	0.278	0.186	0.004	0.261
14010	6.41	0.272	0.276	0.188	0	0.263
14040	6.31	0.272	0.276	0.19	0.005	0.264
14070	6.39	0.272	0.278	0.187	0.007	0.265
14100	6.31	0.274	0.278	0.187	0.006	0.261
14130	6.33	0.273	0.277	0.188	0.003	0.259
14160	6.29	0.27	0.276	0.186	0.002	0.259
14190	6.33	0.271	0.277	0.186	0.002	0.262
14220	6.31	0.273	0.279	0.189	0.006	0.261
14250	6.37	0.274	0.278	0.195	0.006	0.259
14280	5.78	0.273	0.278	0.196	0.005	0.258
14310	6.31	0.273	0.277	0.196	0.005	0.26
14340	6.41	0.271	0.277	0.194	0.005	0.26
14370	6.31	0.263	0.277	0.193	0.006	0.259
14400	6.33	0.265	0.277	0.192	0.004	0.26
14430	6.41	0.269	0.275	0.193	0.005	0.26
14460	6.41	0.273	0.278	0.193	0.006	0.259
14490	6.33	0.272	0.277	0.196	0.005	0.262
14520	6.35	0.273	0.278	0.197	0.006	0.26
14550	6.39	0.274	0.279	0.198	0.007	0.26
14580	6.61	0.277	0.281	0.196	0.009	0.26
14610	6.35	0.275	0.281	0.198	0.01	0.261
14640	6.37	0.272	0.279	0.195	0	0.262

Royal Farms Store No. 96
RW-13 Constant Rate Pumping Test - Water Levels
Test Conducted 1-13-2012

Time (seconds)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
14670	6.31	0.273	0.279	0.196	0.009	0.262
14700	6.39	0.273	0.279	0.196	0.004	0.264
14730	6.37	0.273	0.28	0.198	0.006	0.266
14760	6.31	0.275	0.279	0.196	0.004	0.263
14790	6.33	0.273	0.281	0.194	0.001	0.263
14820	6.35	0.273	0.278	0.192	0.005	0.264
14850	6.33	0.273	0.277	0.198	0.003	0.26
14880	6.35	0.274	0.281	0.194	0.002	0.261
14910	6.37	0.275	0.281	0.192	0.005	0.263
14940	6.31	0.274	0.279	0.194	0.005	0.263
14970	6.31	0.274	0.281	0.191	0.007	0.263
15000	6.33	0.274	0.282	0.194	0.004	0.262
15030	6.31	0.276	0.283	0.193	0.01	0.253
15060	6.39	0.274	0.281	0.192	0.011	0.263
15090	6.33	0.274	0.282	0.19	0.01	0.262
15120	6.41	0.274	0.283	0.195	0.012	0.263
15150	6.37	0.276	0.28	0.187	0.009	0.265
15180	6.29	0.274	0.276	0.198	0.014	0.268
15210	6.39	0.277	0.28	0.192	0.011	0.265
15240	6.35	0.274	0.282	0.194	0.015	0.264
15270	6.37	0.277	0.281	0.191	0.016	0.262
15300	6.31	0.277	0.281	0.192	0.014	0.264
15330	6.31	0.276	0.281	0.193	0.019	0.265
15360	6.39	0.277	0.28	0.198	0.017	0.262
15390	6.33	0.278	0.282	0.194	0.021	0.264
15420	6.33	0.276	0.282	0.192	0.017	0.265
15450	6.33	0.273	0.28	0.188	0.019	0.266
15480	6.35	0.268	0.28	0.185	0.021	0.265
15510	6.41	0.272	0.281	0.193	0.016	0.261
15540	6.41	0.279	0.283	0.19	0.018	0.264
15570	6.26	0.279	0.284	0.191	0.018	0.264
15600	6.33	0.279	0.285	0.193	0.018	0.263
15630	6.39	0.278	0.284	0.192	0.016	0.264
15660	6.41	0.278	0.284	0.192	0.014	0.267
15690	6.39	0.278	0.288	0.192	0.015	0.269
15720	6.41	0.277	0.285	0.191	0.014	0.265
15750	6.31	0.279	0.284	0.194	0.013	0.266
15780	6.39	0.278	0.285	0.188	0.013	0.269
15810	6.39	0.274	0.285	0.19	0.01	0.266
15840	5.8	0.275	0.283	0.19	0.008	0.271
15870	6.33	0.275	0.283	0.192	0.01	0.266
15900	6.39	0.277	0.283	0.189	0.004	0.265
15930	6.39	0.275	0.283	0.186	0.005	0.267
15960	6.33	0.275	0.28	0.186	0.004	0.263
15990	6.35	0.271	0.28	0.186	0.005	0.266
16020	6.41	0.274	0.282	0.183	0.002	0.265
Distance from RW-13	0.01	21	21	23	27	28

Table 2
Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
0	0	0	0	0	0
30	0.003	0.002	0.003	-0.001	0.001
60	0.007	0.007	0.006	0.003	0.003
90	0.026	0.01	0.016	0.041	0.005
120	0.064	0.039	0.044	0.021	0.014
150	0.094	0.15	0.077	0.047	0.027
180	0.106	0.062	0.122	0.062	0.038
210	0.117	0.095	0.148	0.078	0.05
240	0.122	0.118	0.084	0.092	0.06
270	0.159	0.129	0.107	0.105	0.071
300	0.12	0.146	0.124	0.116	0.081
330	0.142	0.16	0.136	0.123	0.091
360	0.158	0.173	0.147	0.174	0.102
390	0.169	0.189	0.163	0.182	0.113
420	0.178	0.201	0.173	0.146	0.125
450	0.188	0.288	0.183	0.17	0.137
480	0.193	0.176	0.191	0.176	0.147
510	0.198	0.196	0.238	0.183	0.157
540	0.203	0.221	0.237	0.189	0.167
570	0.232	0.229	0.159	0.198	0.176
600	0.139	0.225	0.17	0.196	0.183
630	0.166	0.226	0.176	0.196	0.191
660	0.178	0.228	0.177	0.198	0.196
690	0.184	0.228	0.179	0.234	0.202
720	0.189	0.231	0.184	0.226	0.205
750	0.192	0.236	0.187	0.176	0.212
780	0.199	0.323	0.195	0.199	0.217
810	0.205	0.31	0.203	0.209	0.221
840	0.212	0.19	0.237	0.213	0.227
870	0.218	0.229	0.255	0.219	0.233
900	0.224	0.25	0.253	0.228	0.238
930	0.221	0.259	0.166	0.23	0.242
960	0.258	0.263	0.18	0.233	0.247
990	0.246	0.267	0.201	0.237	0.251
1020	0.172	0.272	0.214	0.238	0.256
1050	0.204	0.274	0.217	0.243	0.26
1080	0.218	0.279	0.225	0.246	0.263
1110	0.227	0.283	0.229	0.247	0.268
1140	0.234	0.286	0.233	0.255	0.271

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
1170	0.24	0.291	0.236	0.258	0.275
1200	0.241	0.299	0.246	0.261	0.28
1230	0.24	0.299	0.245	0.259	0.284
1260	0.237	0.297	0.244	0.265	0.287
1290	0.234	0.296	0.241	0.261	0.288
1320	0.231	0.294	0.24	0.259	0.289
1350	0.227	0.286	0.236	0.293	0.289
1380	0.227	0.288	0.235	0.279	0.291
1410	0.225	0.288	0.237	0.27	0.292
1440	0.226	0.281	0.236	0.23	0.291
1470	0.224	0.364	0.236	0.242	0.29
1500	0.226	0.344	0.238	0.247	0.291
1530	0.223	0.222	0.231	0.243	0.29
1560	0.227	0.252	0.283	0.243	0.29
1590	0.226	0.265	0.276	0.245	0.29
1620	0.227	0.272	0.268	0.246	0.291
1650	0.231	0.277	0.26	0.246	0.29
1680	0.284	0.279	0.165	0.248	0.291
1710	0.267	0.277	0.193	0.247	0.293
1740	0.185	0.281	0.217	0.249	0.293
1770	0.218	0.281	0.222	0.254	0.296
1800	0.232	0.285	0.231	0.254	0.296
1830	0.238	0.288	0.233	0.257	0.295
1860	0.242	0.291	0.24	0.259	0.298
1890	0.244	0.294	0.242	0.259	0.298
1920	0.247	0.295	0.242	0.262	0.3
1950	0.245	0.295	0.244	0.263	0.301
1980	0.245	0.297	0.243	0.294	0.302
2010	0.25	0.3	0.245	0.297	0.305
2040	0.252	0.305	0.248	0.241	0.305
2070	0.254	0.389	0.252	0.259	0.307
2100	0.254	0.37	0.254	0.266	0.308
2130	0.256	0.24	0.27	0.267	0.309
2160	0.259	0.273	0.296	0.266	0.31
2190	0.263	0.293	0.289	0.268	0.311
2220	0.266	0.303	0.282	0.272	0.314
2250	0.27	0.315	0.28	0.277	0.318
2280	0.269	0.317	0.274	0.28	0.318
2310	0.319	0.313	0.189	0.279	0.32
2340	0.299	0.314	0.22	0.283	0.322

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RW-13 Modified Step Drawdown Test
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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
2370	0.197	0.319	0.241	0.279	0.323
2400	0.242	0.318	0.248	0.283	0.325
2430	0.259	0.322	0.253	0.285	0.327
2460	0.27	0.324	0.259	0.288	0.328
2490	0.272	0.325	0.264	0.288	0.332
2520	0.277	0.329	0.262	0.29	0.334
2550	0.277	0.331	0.269	0.294	0.335
2580	0.28	0.335	0.269	0.295	0.336
2610	0.28	0.334	0.268	0.299	0.338
2640	0.284	0.336	0.272	0.336	0.339
2670	0.286	0.343	0.273	0.27	0.343
2700	0.287	0.341	0.276	0.288	0.344
2730	0.285	0.34	0.276	0.297	0.345
2760	0.289	0.421	0.281	0.308	0.348
2790	0.291	0.282	0.281	0.306	0.349
2820	0.293	0.314	0.327	0.308	0.351
2850	0.298	0.336	0.325	0.31	0.353
2880	0.297	0.345	0.316	0.312	0.355
2910	0.297	0.351	0.307	0.312	0.356
2940	0.299	0.355	0.225	0.311	0.359
2970	0.333	0.344	0.227	0.31	0.359
3000	0.315	0.343	0.252	0.313	0.36
3030	0.269	0.347	0.265	0.314	0.361
3060	0.291	0.345	0.267	0.312	0.361
3090	0.299	0.346	0.275	0.311	0.361
3120	0.308	0.35	0.278	0.334	0.363
3150	0.311	0.351	0.282	0.347	0.364
3180	0.314	0.355	0.287	0.287	0.365
3210	0.317	0.356	0.285	0.291	0.367
3240	0.321	0.434	0.296	0.304	0.369
3270	0.321	0.418	0.298	0.307	0.37
3300	0.318	0.277	0.293	0.308	0.372
3330	0.32	0.314	0.334	0.306	0.371
3360	0.321	0.333	0.33	0.306	0.373
3390	0.325	0.349	0.323	0.31	0.374
3420	0.325	0.357	0.317	0.31	0.375
3450	0.326	0.363	0.313	0.312	0.375
3480	0.325	0.364	0.307	0.311	0.378
3510	0.324	0.364	0.207	0.312	0.378
3540	0.356	0.36	0.237	0.314	0.378

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
3570	0.341	0.365	0.268	0.315	0.38
3600	0.289	0.367	0.279	0.312	0.384
3630	0.305	0.368	0.284	0.315	0.383
3660	0.311	0.366	0.289	0.313	0.383
3690	0.315	0.364	0.284	0.313	0.382
3720	0.317	0.366	0.294	0.314	0.383
3750	0.319	0.367	0.295	0.315	0.385
3780	0.322	0.369	0.298	0.318	0.386
3810	0.323	0.369	0.297	0.318	0.386
3840	0.323	0.37	0.298	0.316	0.387
3870	0.326	0.372	0.298	0.319	0.388
3900	0.328	0.375	0.3	0.32	0.389
3930	0.326	0.376	0.302	0.322	0.39
3960	0.33	0.379	0.301	0.323	0.392
3990	0.333	0.381	0.304	0.327	0.393
4020	0.334	0.381	0.304	0.326	0.396
4050	0.333	0.384	0.305	0.328	0.396
4080	0.337	0.386	0.305	0.333	0.398
4110	0.336	0.387	0.308	0.333	0.399
4140	0.339	0.391	0.308	0.334	0.4
4170	0.338	0.388	0.309	0.336	0.403
4200	0.329	0.386	0.307	0.332	0.401
4230	0.328	0.38	0.301	0.331	0.4
4260	0.325	0.375	0.298	0.326	0.399
4290	0.326	0.374	0.297	0.325	0.398
4320	0.327	0.376	0.298	0.329	0.398
4350	0.328	0.377	0.296	0.326	0.399
4380	0.327	0.377	0.298	0.359	0.397
4410	0.326	0.375	0.298	0.353	0.398
4440	0.326	0.378	0.298	0.343	0.398
4470	0.324	0.375	0.29	0.307	0.397
4500	0.327	0.45	0.305	0.317	0.396
4530	0.328	0.432	0.302	0.323	0.395
4560	0.326	0.298	0.325	0.321	0.397
4590	0.326	0.336	0.344	0.318	0.394
4620	0.329	0.352	0.337	0.321	0.394
4650	0.329	0.362	0.33	0.32	0.394
4680	0.334	0.371	0.325	0.322	0.397
4710	0.335	0.374	0.322	0.323	0.397
4740	0.338	0.378	0.321	0.328	0.399

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
4770	0.331	0.375	0.23	0.325	0.399
4800	0.374	0.372	0.259	0.325	0.4
4830	0.356	0.375	0.283	0.327	0.399
4860	0.272	0.379	0.293	0.33	0.402
4890	0.314	0.377	0.296	0.326	0.402
4920	0.334	0.377	0.301	0.328	0.401
4950	0.34	0.38	0.303	0.329	0.403
4980	0.345	0.382	0.307	0.332	0.403
5010	0.344	0.382	0.304	0.33	0.402
5040	0.347	0.384	0.306	0.33	0.403
5070	0.348	0.384	0.307	0.33	0.403
5100	0.349	0.384	0.305	0.333	0.404
5130	0.352	0.386	0.308	0.332	0.404
5160	0.352	0.387	0.308	0.335	0.404
5190	0.352	0.387	0.311	0.335	0.405
5220	0.354	0.39	0.31	0.338	0.407
5250	0.355	0.39	0.311	0.339	0.407
5280	0.355	0.392	0.315	0.34	0.408
5310	0.355	0.39	0.317	0.341	0.408
5340	0.359	0.394	0.318	0.34	0.411
5370	0.361	0.395	0.32	0.341	0.411
5400	0.363	0.396	0.322	0.372	0.413
5430	0.358	0.396	0.32	0.371	0.413
5460	0.353	0.395	0.318	0.326	0.412
5490	0.355	0.392	0.316	0.347	0.412
5520	0.357	0.393	0.319	0.335	0.413
5550	0.354	0.394	0.315	0.308	0.414
5580	0.35	0.388	0.316	0.319	0.411
5610	0.35	0.385	0.312	0.306	0.411
5640	0.352	0.472	0.316	0.32	0.41
5670	0.35	0.455	0.319	0.325	0.41
5700	0.35	0.347	0.356	0.321	0.409
5730	0.348	0.365	0.351	0.318	0.406
5760	0.345	0.374	0.342	0.317	0.406
5790	0.36	0.378	0.282	0.32	0.404
5820	0.369	0.374	0.263	0.319	0.403
5850	0.352	0.374	0.288	0.315	0.403
5880	0.343	0.374	0.295	0.316	0.402
5910	0.308	0.375	0.298	0.316	0.4
5940	0.335	0.376	0.298	0.317	0.397

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
5970	0.347	0.374	0.301	0.349	0.395
6000	0.352	0.377	0.307	0.343	0.396
6030	0.357	0.38	0.308	0.3	0.397
6060	0.36	0.442	0.308	0.305	0.397
6090	0.362	0.456	0.318	0.318	0.399
6120	0.363	0.441	0.321	0.327	0.4
6150	0.36	0.32	0.336	0.32	0.399
6180	0.362	0.352	0.356	0.319	0.4
6210	0.363	0.368	0.352	0.322	0.4
6240	0.364	0.378	0.345	0.323	0.4
6270	0.365	0.384	0.34	0.321	0.402
6300	0.367	0.389	0.337	0.327	0.404
6330	0.388	0.387	0.259	0.326	0.405
6360	0.372	0.388	0.284	0.326	0.407
6390	0.291	0.389	0.301	0.329	0.409
6420	0.328	0.391	0.307	0.329	0.41
6450	0.354	0.396	0.371	0.331	0.41
6480	0.365	0.402	0.366	0.335	0.411
6510	0.371	0.407	0.361	0.338	0.412
6540	0.373	0.409	0.356	0.34	0.412
6570	0.371	0.41	0.352	0.344	0.414
6600	0.371	0.41	0.346	0.342	0.416
6630	0.375	0.408	0.345	0.342	0.417
6660	0.372	0.408	0.343	0.343	0.418
6690	0.369	0.403	0.251	0.373	0.42
6720	0.367	0.4	0.281	0.361	0.421
6750	0.373	0.403	0.304	0.356	0.419
6780	0.374	0.409	0.318	0.316	0.421
6810	0.377	0.494	0.332	0.334	0.422
6840	0.378	0.473	0.341	0.345	0.425
6870	0.379	0.46	0.341	0.351	0.424
6900	0.379	0.452	0.342	0.349	0.426
6930	0.405	0.345	0.335	0.345	0.426
6960	0.404	0.373	0.334	0.346	0.427
6990	0.385	0.39	0.34	0.345	0.429
7020	0.377	0.4	0.337	0.348	0.428
7050	0.372	0.405	0.341	0.35	0.431
7080	0.332	0.408	0.336	0.351	0.431
7110	0.357	0.492	0.344	0.356	0.432
7140	0.37	0.474	0.344	0.36	0.432

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
7170	0.372	0.461	0.349	0.362	0.433
7200	0.373	0.45	0.347	0.363	0.433
7230	0.374	0.446	0.347	0.361	0.433
7260	0.373	0.443	0.346	0.36	0.435
7290	0.373	0.439	0.345	0.359	0.434
7320	0.373	0.436	0.345	0.36	0.435
7350	0.374	0.435	0.343	0.361	0.436
7380	0.373	0.433	0.342	0.362	0.436
7410	0.376	0.432	0.343	0.361	0.438
7440	0.377	0.43	0.345	0.36	0.437
7470	0.376	0.432	0.344	0.362	0.437
7500	0.379	0.431	0.343	0.358	0.437
7530	0.377	0.428	0.349	0.362	0.439
7560	0.378	0.426	0.351	0.358	0.437
7590	0.378	0.431	0.348	0.359	0.439
7620	0.377	0.429	0.347	0.36	0.44
7650	0.379	0.43	0.346	0.361	0.44
7680	0.38	0.428	0.347	0.362	0.44
7710	0.377	0.43	0.349	0.36	0.441
7740	0.383	0.428	0.347	0.362	0.44
7770	0.386	0.433	0.357	0.363	0.441
7800	0.384	0.433	0.354	0.364	0.441
7830	0.384	0.431	0.354	0.363	0.442
7860	0.386	0.432	0.353	0.365	0.442
7890	0.38	0.431	0.351	0.365	0.443
7920	0.381	0.43	0.351	0.365	0.443
7950	0.38	0.427	0.35	0.364	0.442
7980	0.381	0.406	0.348	0.357	0.443
8010	0.377	0.355	0.338	0.353	0.442
8040	0.376	0.33	0.337	0.391	0.443
8070	0.377	0.362	0.339	0.376	0.441
8100	0.374	0.382	0.338	0.304	0.441
8130	0.38	0.497	0.343	0.33	0.44
8160	0.381	0.496	0.354	0.347	0.441
8190	0.38	0.352	0.357	0.345	0.441
8220	0.417	0.378	0.336	0.348	0.44
8250	0.397	0.394	0.342	0.352	0.442
8280	0.386	0.402	0.345	0.353	0.442
8310	0.381	0.409	0.348	0.354	0.441
8340	0.381	0.416	0.349	0.357	0.441

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
8370	0.378	0.418	0.348	0.358	0.442
8400	0.378	0.419	0.348	0.358	0.442
8430	0.378	0.422	0.35	0.358	0.442
8460	0.379	0.422	0.349	0.362	0.442
8490	0.378	0.422	0.352	0.36	0.443
8520	0.291	0.423	0.35	0.36	0.443
8550	0.343	0.423	0.39	0.361	0.443
8580	0.366	0.427	0.399	0.363	0.443
8610	0.377	0.43	0.393	0.363	0.444
8640	0.383	0.433	0.385	0.366	0.445
8670	0.383	0.434	0.378	0.367	0.446
8700	0.383	0.438	0.375	0.368	0.448
8730	0.386	0.436	0.374	0.37	0.448
8760	0.388	0.439	0.373	0.37	0.449
8790	0.39	0.443	0.37	0.371	0.45
8820	0.389	0.441	0.369	0.373	0.45
8850	0.391	0.443	0.367	0.374	0.452
8880	0.391	0.442	0.368	0.373	0.452
8910	0.393	0.442	0.366	0.374	0.453
8940	0.393	0.443	0.369	0.376	0.454
8970	0.396	0.446	0.369	0.376	0.457
9000	0.396	0.448	0.369	0.38	0.458
9030	0.399	0.446	0.373	0.38	0.46
9060	0.401	0.45	0.372	0.383	0.459
9090	0.402	0.45	0.372	0.382	0.461
9120	0.403	0.45	0.375	0.385	0.461
9150	0.403	0.452	0.376	0.386	0.463
9180	0.404	0.454	0.379	0.386	0.465
9210	0.404	0.456	0.374	0.389	0.466
9240	0.407	0.456	0.378	0.39	0.467
9270	0.401	0.45	0.28	0.421	0.469
9300	0.403	0.446	0.318	0.411	0.469
9330	0.403	0.45	0.34	0.405	0.47
9360	0.404	0.452	0.357	0.4	0.471
9390	0.408	0.457	0.362	0.402	0.472
9420	0.409	0.462	0.37	0.356	0.473
9450	0.413	0.547	0.379	0.38	0.474
9480	0.418	0.528	0.385	0.394	0.476
9510	0.418	0.517	0.386	0.401	0.478
9540	0.421	0.509	0.389	0.406	0.48

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Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
9570	0.423	0.505	0.389	0.409	0.483
9600	0.427	0.5	0.393	0.409	0.484
9630	0.427	0.497	0.396	0.412	0.486
9660	0.423	0.372	0.385	0.403	0.488
9690	0.424	0.412	0.382	0.4	0.489
9720	0.424	0.436	0.382	0.405	0.492
9750	0.472	0.45	0.387	0.404	0.491
9780	0.456	0.463	0.391	0.408	0.492
9810	0.366	0.471	0.397	0.411	0.494
9840	0.407	0.476	0.392	0.412	0.496
9870	0.42	0.476	0.39	0.415	0.497
9900	0.425	0.479	0.391	0.415	0.498
9930	0.429	0.48	0.392	0.415	0.499
9960	0.434	0.485	0.394	0.418	0.5
9990	0.435	0.485	0.396	0.418	0.503
10020	0.436	0.487	0.397	0.424	0.505
10050	0.437	0.489	0.399	0.423	0.506
10080	0.438	0.491	0.4	0.425	0.506
10110	0.438	0.487	0.399	0.424	0.508
10140	0.44	0.49	0.399	0.426	0.509
10170	0.438	0.491	0.401	0.423	0.509
10200	0.44	0.49	0.4	0.425	0.511
10230	0.44	0.493	0.401	0.427	0.511
10260	0.441	0.494	0.401	0.426	0.513
10290	0.437	0.496	0.401	0.428	0.513
10320	0.44	0.495	0.399	0.43	0.515
10350	0.44	0.495	0.403	0.426	0.515
10380	0.441	0.494	0.404	0.427	0.515
10410	0.441	0.493	0.403	0.429	0.515
10440	0.445	0.494	0.403	0.429	0.52
10470	0.446	0.498	0.406	0.43	0.515
10500	0.447	0.495	0.405	0.433	0.519
10530	0.444	0.498	0.405	0.43	0.52
10560	0.447	0.498	0.405	0.431	0.521
10590	0.447	0.499	0.406	0.431	0.52
10620	0.446	0.499	0.404	0.43	0.52
10650	0.449	0.501	0.404	0.434	0.521
10680	0.448	0.499	0.408	0.434	0.523
10710	0.451	0.499	0.407	0.434	0.523
10740	0.45	0.5	0.408	0.436	0.524

Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
10770	0.45	0.499	0.409	0.434	0.524
10800	0.449	0.5	0.41	0.434	0.522
10830	0.449	0.5	0.407	0.434	0.525
10860	0.45	0.503	0.407	0.437	0.524
10890	0.451	0.503	0.408	0.436	0.524
10920	0.451	0.505	0.409	0.435	0.524
10950	0.451	0.506	0.407	0.435	0.525
10980	0.451	0.505	0.408	0.438	0.525
11010	0.45	0.504	0.407	0.436	0.524
11040	0.454	0.504	0.41	0.437	0.526
11070	0.455	0.507	0.409	0.44	0.526
11100	0.457	0.506	0.411	0.47	0.527
11130	0.458	0.511	0.412	0.46	0.529
11160	0.459	0.509	0.411	0.428	0.528
11190	0.457	0.586	0.418	0.438	0.529
11220	0.461	0.566	0.42	0.446	0.53
11250	0.461	0.449	0.436	0.442	0.531
11280	0.462	0.482	0.459	0.443	0.531
11310	0.466	0.499	0.453	0.443	0.532
11340	0.466	0.508	0.447	0.447	0.533
11370	0.513	0.509	0.363	0.445	0.535
11400	0.491	0.508	0.385	0.444	0.534
11430	0.482	0.508	0.4	0.446	0.535
11460	0.416	0.508	0.406	0.445	0.536
11490	0.44	0.507	0.409	0.441	0.523
11520	0.45	0.506	0.407	0.442	0.522
11550	0.453	0.507	0.407	0.442	0.52
11580	0.453	0.504	0.408	0.441	0.52
11610	0.454	0.504	0.409	0.472	0.52
11640	0.45	0.506	0.409	0.465	0.519
11670	0.455	0.507	0.409	0.454	0.519
11700	0.456	0.508	0.409	0.411	0.519
11730	0.458	0.592	0.414	0.429	0.52
11760	0.461	0.574	0.417	0.438	0.52
11790	0.461	0.557	0.42	0.446	0.521
11820	0.461	0.549	0.42	0.449	0.521
11850	0.461	0.541	0.421	0.45	0.522
11880	0.458	0.539	0.417	0.444	0.522
11910	0.457	0.436	0.455	0.438	0.522
11940	0.459	0.465	0.451	0.438	0.522

Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
11970	0.463	0.486	0.444	0.439	0.523
12000	0.46	0.496	0.436	0.441	0.521
12030	0.46	0.504	0.395	0.442	0.522
12060	0.5	0.501	0.356	0.443	0.523
12090	0.482	0.502	0.379	0.443	0.523
12120	0.474	0.505	0.398	0.443	0.522
12150	0.413	0.506	0.403	0.442	0.524
12180	0.443	0.508	0.405	0.444	0.524
12210	0.458	0.509	0.41	0.448	0.522
12240	0.461	0.509	0.41	0.446	0.523
12270	0.466	0.51	0.411	0.445	0.525
12300	0.466	0.511	0.413	0.447	0.523
12330	0.467	0.51	0.412	0.442	0.523
12360	0.467	0.511	0.413	0.479	0.524
12390	0.467	0.513	0.415	0.468	0.525
12420	0.464	0.512	0.412	0.462	0.525
12450	0.466	0.511	0.412	0.405	0.524
12480	0.469	0.598	0.416	0.429	0.525
12510	0.472	0.579	0.419	0.442	0.523
12540	0.472	0.563	0.42	0.448	0.525
12570	0.472	0.429	0.42	0.444	0.524
12600	0.471	0.469	0.462	0.442	0.525
12630	0.473	0.488	0.454	0.445	0.525
12660	0.472	0.5	0.446	0.446	0.525
12690	0.506	0.502	0.368	0.446	0.525
12720	0.485	0.501	0.385	0.445	0.526
12750	0.474	0.507	0.401	0.444	0.526
12780	0.472	0.508	0.409	0.445	0.525
12810	0.422	0.508	0.41	0.443	0.526
12840	0.446	0.506	0.41	0.442	0.525
12870	0.455	0.507	0.41	0.443	0.524
12900	0.459	0.508	0.411	0.444	0.524
12930	0.46	0.51	0.409	0.443	0.524
12960	0.462	0.509	0.41	0.447	0.523
12990	0.463	0.512	0.412	0.445	0.522
13020	0.461	0.511	0.412	0.446	0.525
13050	0.461	0.51	0.41	0.443	0.523
13080	0.462	0.509	0.411	0.446	0.524
13110	0.463	0.51	0.413	0.447	0.523
13140	0.464	0.513	0.412	0.446	0.524

Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
13170	0.464	0.513	0.416	0.441	0.524
13200	0.467	0.514	0.415	0.444	0.524
13230	0.47	0.513	0.414	0.447	0.526
13260	0.468	0.515	0.419	0.477	0.526
13290	0.469	0.519	0.42	0.47	0.528
13320	0.469	0.518	0.418	0.462	0.527
13350	0.467	0.517	0.418	0.429	0.527
13380	0.469	0.6	0.421	0.443	0.529
13410	0.471	0.584	0.425	0.45	0.527
13440	0.474	0.57	0.426	0.456	0.53
13470	0.473	0.435	0.421	0.451	0.53
13500	0.471	0.468	0.462	0.447	0.529
13530	0.471	0.491	0.461	0.447	0.528
13560	0.471	0.505	0.451	0.447	0.53
13590	0.474	0.512	0.443	0.45	0.53
13620	0.473	0.514	0.439	0.453	0.53
13650	0.473	0.52	0.433	0.45	0.53
13680	0.474	0.52	0.432	0.454	0.531
13710	0.475	0.522	0.434	0.453	0.532
13740	0.525	0.52	0.336	0.455	0.533
13770	0.507	0.512	0.364	0.452	0.532
13800	0.491	0.515	0.387	0.453	0.531
13830	0.485	0.517	0.403	0.452	0.534
13860	0.432	0.518	0.408	0.453	0.532
13890	0.456	0.519	0.413	0.452	0.532
13920	0.468	0.52	0.415	0.455	0.534
13950	0.473	0.522	0.418	0.454	0.533
13980	0.475	0.524	0.423	0.458	0.533
14010	0.476	0.524	0.422	0.456	0.535
14040	0.479	0.524	0.423	0.457	0.534
14070	0.48	0.526	0.423	0.46	0.536
14100	0.478	0.526	0.424	0.46	0.538
14130	0.478	0.525	0.422	0.458	0.536
14160	0.48	0.528	0.426	0.46	0.538
14190	0.484	0.531	0.428	0.46	0.538
14220	0.485	0.531	0.431	0.461	0.538
14250	0.484	0.532	0.43	0.462	0.54
14280	0.485	0.532	0.429	0.463	0.54
14310	0.487	0.535	0.431	0.496	0.541
14340	0.488	0.536	0.433	0.488	0.542

Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
14370	0.488	0.539	0.434	0.484	0.544
14400	0.485	0.539	0.435	0.48	0.544
14430	0.488	0.536	0.435	0.443	0.544
14460	0.494	0.615	0.441	0.462	0.546
14490	0.495	0.599	0.446	0.472	0.547
14520	0.495	0.589	0.447	0.471	0.551
14550	0.498	0.487	0.484	0.472	0.551
14580	0.496	0.514	0.481	0.472	0.551
14610	0.499	0.534	0.472	0.471	0.552
14640	0.539	0.538	0.396	0.472	0.553
14670	0.533	0.539	0.402	0.475	0.554
14700	0.518	0.542	0.423	0.477	0.555
14730	0.512	0.544	0.434	0.48	0.557
14760	0.453	0.549	0.436	0.481	0.559
14790	0.484	0.546	0.439	0.479	0.558
14820	0.496	0.549	0.439	0.479	0.56
14850	0.504	0.552	0.439	0.48	0.56
14880	0.506	0.551	0.443	0.481	0.561
14910	0.511	0.554	0.443	0.483	0.562
14940	0.511	0.556	0.447	0.487	0.563
14970	0.503	0.552	0.44	0.483	0.564
15000	0.493	0.543	0.43	0.477	0.561
15030	0.485	0.535	0.423	0.47	0.559
15060	0.481	0.526	0.421	0.465	0.554
15090	0.478	0.523	0.415	0.459	0.55
15120	0.477	0.52	0.412	0.457	0.549
15150	0.478	0.518	0.414	0.457	0.543
15180	0.478	0.516	0.411	0.456	0.54
15210	0.478	0.519	0.412	0.454	0.54
15240	0.477	0.519	0.412	0.451	0.537
15270	0.476	0.516	0.411	0.454	0.538
15300	0.478	0.515	0.41	0.451	0.537
15330	0.476	0.517	0.41	0.477	0.535
15360	0.475	0.515	0.41	0.45	0.532
15390	0.475	0.515	0.408	0.448	0.533
15420	0.48	0.596	0.417	0.458	0.532
15450	0.478	0.468	0.415	0.454	0.531
15480	0.477	0.485	0.459	0.452	0.532
15510	0.48	0.504	0.451	0.451	0.531
15540	0.525	0.507	0.368	0.451	0.53

Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
15570	0.503	0.509	0.386	0.449	0.529
15600	0.491	0.512	0.398	0.451	0.529
15630	0.428	0.513	0.403	0.449	0.529
15660	0.452	0.511	0.404	0.452	0.529
15690	0.464	0.512	0.408	0.451	0.528
15720	0.468	0.511	0.407	0.445	0.528
15750	0.468	0.514	0.408	0.448	0.526
15780	0.471	0.514	0.41	0.447	0.528
15810	0.473	0.517	0.411	0.45	0.528
15840	0.472	0.518	0.414	0.452	0.528
15870	0.473	0.519	0.415	0.452	0.529
15900	0.472	0.519	0.414	0.452	0.529
15930	0.472	0.521	0.414	0.454	0.528
15960	0.473	0.52	0.415	0.453	0.527
15990	0.471	0.518	0.411	0.451	0.529
16020	0.47	0.516	0.411	0.451	0.528
16050	0.469	0.514	0.41	0.45	0.529
16080	0.468	0.516	0.41	0.449	0.52
16110	0.469	0.516	0.411	0.447	0.522
16140	0.467	0.514	0.41	0.449	0.523
16170	0.466	0.512	0.41	0.448	0.522
16200	0.467	0.511	0.406	0.447	0.521
16230	0.471	0.514	0.408	0.45	0.522
16260	0.47	0.515	0.409	0.449	0.521
16290	0.475	0.514	0.41	0.45	0.523
16320	0.474	0.517	0.411	0.453	0.523
16350	0.475	0.518	0.412	0.45	0.525
16380	0.473	0.518	0.41	0.451	0.525
16410	0.475	0.518	0.413	0.451	0.526
16440	0.476	0.518	0.414	0.449	0.527
16470	0.474	0.518	0.414	0.451	0.526
16500	0.475	0.518	0.413	0.45	0.527
16530	0.475	0.517	0.413	0.451	0.528
16560	0.473	0.517	0.412	0.451	0.528
16590	0.477	0.518	0.414	0.452	0.529
16620	0.478	0.52	0.418	0.454	0.529
16650	0.48	0.523	0.419	0.456	0.53
16680	0.479	0.525	0.421	0.456	0.532
16710	0.423	0.493	0.38	0.433	0.525

Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-2	RW-10
Distance from RW- 13	21	21	23	27	28

Table 3
Royal Farms Store No. 96
RW-13 Modified Step Drawdown Test
Test Conducted 1-12-2012

Vacuum Readings (Inch H2O)

Time (min)	RW-13	RW-4	RW-7	RW-6	RW-2	RW-10
Start Step 1 (2 GPM)						
0	129.15	0.02	2.10	1.60	0.60	0.02
1	129.15	1.30	2.10	0.90	0.62	0.04
6	129.15	1.40	2.40	2.10	0.85	0.04
12	129.15	0.60	2.40	2.50	0.80	0.09
22	129.15	1.60	2.50	2.60	0.70	0.04
32	129.15	1.65	2.60	2.80	0.80	0.04
42	129.15	1.55	2.55	2.75	0.80	0.04
52	129.15	1.65	2.65	2.85	0.80	0.04
62	129.15	1.55	2.60	2.90	0.70	0.04
83	129.15	1.55	2.40	2.40	0.65	0.04
Average (Step 1)	129.15	1.29	2.43	2.34	0.73	0.04
Start Step 2 (3 GPM)						
94	129.15	1.60	2.70	2.75	0.75	0.03
124	129.15	1.65	3.00	3.10	0.90	0.03
146	129.15	1.60	3.20	3.20	0.45	0.03
174	129.15	1.75	2.55	2.50	0.65	0.28
185	129.15	1.65	2.60	2.60	0.90	0.12
Average (Step 2)	129.15	1.65	2.81	2.83	0.73	0.10
Start Step 3 (4 GPM)						
197	129.15	1.50	2.75	2.50	0.85	0.11
212	129.15	1.70	2.70	2.45	0.75	0.11
230	129.15	1.70	2.70	2.45	0.65	0.12
245	129.15	1.75	2.60	2.30	0.60	0.11
Average (Step 3)	129.15	1.66	2.69	2.43	0.71	0.11
Distance from RW-13	0.01	21	21	23	27	28

Table 4

Royal Farms Store No. 96

RW-13 Modified Step Drawdown Test

Test Conducted 1-12-2012

Vacuum Pump and Effluent Stack Measurements

Elapsed Time (min)	Air Flow (cfm)	PID (PPM)	Vacuum (in-Hg)
Step 1			
0	79	390	8.00
7	64	NM	8.00
12	63	49	8.00
14	61	NM	9.00
19	52	480	9.00
40	61	419	9.00
64	56	458	9.00
Step 1 flow rate - 2 gpm			
Step 2 starts at 90 minutes			
107	79	433	8.50
132	45	454	8.50
142	45	428	8.50
165	42	492	8.50
177	67	462	8.50
Step 2 flow rate - 3 gpm			
Step 3 starts at 180 minutes			
187	77	509	8.5
195	61	473	8.25
231	54	493	8.25
260	55	472	8.25
Step 3 flow rate - 4 gpm			

gpm - Gallons Per Minute

NM - Not Measured

cfm - Cubic Feet Per Minute

PID - Photoionization Detector

ppm - Parts Per Million

in-Hg - Inches of Mercury

Table 5
Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
0	0	0	0	0	0
30	0.007	0.011	0.006	0.017	0.012
60	0.019	0.028	0.019	0.03	0.027
90	0.035	0.046	0.037	0.043	0.051
120	0.045	0.061	0.047	0.054	0.058
150	0.053	0.073	0.058	0.065	0.046
180	0.058	0.128	0.065	0.075	0.059
210	0.065	0.122	0.073	0.085	0.069
240	0.067	0.087	0.074	0.094	0.075
270	0.069	0.067	0.088	0.102	0.078
300	0.075	0.09	0.088	0.11	0.083
330	0.08	0.102	0.091	0.121	0.087
360	0.082	0.108	0.075	0.129	0.086
390	0.101	0.112	0.085	0.136	0.09
420	0.097	0.118	0.091	0.142	0.09
450	0.098	0.123	0.097	0.148	0.091
480	0.08	0.131	0.104	0.15	0.095
510	0.093	0.133	0.104	0.157	0.099
540	0.101	0.139	0.108	0.162	0.101
570	0.105	0.143	0.11	0.168	0.1
600	0.107	0.144	0.114	0.173	0.103
630	0.105	0.146	0.114	0.179	0.104
660	0.11	0.146	0.117	0.182	0.103
690	0.114	0.152	0.122	0.187	0.106
720	0.118	0.156	0.124	0.192	0.104
750	0.118	0.158	0.125	0.198	0.126
780	0.122	0.166	0.131	0.201	0.131
810	0.127	0.17	0.134	0.206	0.125
840	0.129	0.168	0.136	0.21	0.079
870	0.129	0.238	0.139	0.213	0.095
900	0.133	0.224	0.146	0.217	0.104
930	0.134	0.212	0.147	0.222	0.109
960	0.133	0.124	0.158	0.225	0.108
990	0.136	0.149	0.151	0.227	0.106
1020	0.136	0.163	0.146	0.231	0.107
1050	0.136	0.171	0.145	0.233	0.106
1080	0.159	0.176	0.132	0.238	0.106
1110	0.164	0.179	0.143	0.24	0.107
1140	0.153	0.18	0.147	0.242	0.11
1170	0.098	0.185	0.151	0.245	0.108
1200	0.13	0.186	0.152	0.246	0.108
1230	0.143	0.191	0.152	0.251	0.11
1260	0.151	0.195	0.159	0.253	0.11

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
1290	0.154	0.199	0.16	0.257	0.11
1320	0.156	0.199	0.156	0.259	0.109
1350	0.158	0.201	0.162	0.261	0.112
1380	0.167	0.209	0.168	0.265	0.139
1410	0.169	0.212	0.171	0.268	0.132
1440	0.17	0.214	0.172	0.272	0.13
1470	0.173	0.288	0.177	0.274	0.098
1500	0.174	0.267	0.18	0.277	0.11
1530	0.177	0.257	0.183	0.28	0.111
1560	0.177	0.162	0.195	0.282	0.113
1590	0.177	0.191	0.189	0.285	0.109
1620	0.176	0.205	0.185	0.287	0.108
1650	0.178	0.211	0.167	0.288	0.108
1680	0.205	0.216	0.178	0.29	0.105
1710	0.195	0.22	0.185	0.291	0.107
1740	0.188	0.222	0.188	0.294	0.108
1770	0.153	0.227	0.187	0.295	0.106
1800	0.16	0.229	0.188	0.294	0.106
1830	0.169	0.231	0.187	0.297	0.105
1860	0.171	0.232	0.191	0.298	0.105
1890	0.172	0.234	0.192	0.3	0.103
1920	0.174	0.236	0.193	0.301	0.131
1950	0.176	0.238	0.196	0.302	0.123
1980	0.178	0.241	0.197	0.304	0.12
2010	0.181	0.241	0.199	0.306	0.07
2040	0.181	0.306	0.201	0.309	0.086
2070	0.185	0.29	0.208	0.309	0.095
2100	0.19	0.283	0.211	0.312	0.101
2130	0.191	0.196	0.226	0.314	0.096
2160	0.193	0.224	0.219	0.317	0.098
2190	0.189	0.235	0.211	0.319	0.095
2220	0.188	0.24	0.207	0.319	0.094
2250	0.187	0.242	0.183	0.322	0.092
2280	0.212	0.24	0.196	0.32	0.088
2310	0.196	0.243	0.202	0.322	0.087
2340	0.193	0.245	0.204	0.324	0.089
2370	0.16	0.245	0.205	0.325	0.084
2400	0.177	0.244	0.207	0.32	0.083
2430	0.184	0.246	0.205	0.321	0.08
2460	0.189	0.249	0.213	0.323	0.081
2490	0.195	0.252	0.212	0.322	0.078
2520	0.193	0.253	0.213	0.325	0.079
2550	0.196	0.255	0.216	0.326	0.077
2580	0.196	0.256	0.218	0.323	0.079

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
2610	0.198	0.26	0.218	0.321	0.077
2640	0.197	0.257	0.218	0.325	0.074
2670	0.197	0.258	0.214	0.326	0.073
2700	0.2	0.259	0.222	0.325	0.076
2730	0.201	0.261	0.225	0.325	0.073
2760	0.203	0.26	0.226	0.327	0.075
2790	0.2	0.261	0.224	0.328	0.075
2820	0.199	0.263	0.226	0.329	0.073
2850	0.202	0.263	0.226	0.328	0.071
2880	0.202	0.265	0.224	0.329	0.069
2910	0.204	0.265	0.224	0.332	0.069
2940	0.206	0.268	0.228	0.333	0.069
2970	0.212	0.272	0.233	0.335	0.068
3000	0.213	0.276	0.233	0.337	0.069
3030	0.214	0.274	0.232	0.338	0.07
3060	0.214	0.276	0.233	0.341	0.069
3090	0.216	0.279	0.235	0.341	0.068
3120	0.216	0.278	0.237	0.341	0.072
3150	0.213	0.277	0.237	0.342	0.068
3180	0.215	0.277	0.238	0.344	0.086
3210	0.217	0.279	0.237	0.345	0.094
3240	0.219	0.284	0.239	0.348	0.085
3270	0.219	0.28	0.243	0.348	0.035
3300	0.221	0.348	0.246	0.349	0.054
3330	0.22	0.331	0.247	0.35	0.059
3360	0.22	0.322	0.245	0.353	0.062
3390	0.22	0.231	0.256	0.353	0.058
3420	0.226	0.258	0.253	0.354	0.055
3450	0.23	0.272	0.253	0.355	0.058
3480	0.227	0.28	0.236	0.357	0.058
3510	0.263	0.282	0.236	0.359	0.054
3540	0.251	0.286	0.247	0.36	0.055
3570	0.241	0.288	0.252	0.361	0.056
3600	0.184	0.291	0.252	0.363	0.055
3630	0.214	0.293	0.251	0.364	0.056
3660	0.227	0.295	0.254	0.369	0.054
3690	0.233	0.298	0.257	0.37	0.056
3720	0.235	0.298	0.259	0.367	0.053
3750	0.237	0.299	0.26	0.368	0.05
3780	0.238	0.3	0.258	0.369	0.052
3810	0.238	0.3	0.26	0.371	0.051
3840	0.24	0.303	0.261	0.373	0.05
3870	0.243	0.308	0.263	0.374	0.047
3900	0.245	0.31	0.266	0.376	0.048

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
3930	0.248	0.311	0.268	0.378	0.052
3960	0.249	0.312	0.269	0.38	0.052
3990	0.251	0.314	0.269	0.382	0.051
4020	0.248	0.314	0.268	0.383	0.05
4050	0.249	0.313	0.268	0.382	0.056
4080	0.246	0.315	0.27	0.386	0.073
4110	0.246	0.314	0.265	0.385	0.063
4140	0.246	0.313	0.266	0.387	0.056
4170	0.246	0.381	0.268	0.386	0.015
4200	0.252	0.373	0.274	0.388	0.03
4230	0.251	0.36	0.274	0.389	0.036
4260	0.252	0.239	0.272	0.389	0.037
4290	0.251	0.274	0.279	0.388	0.029
4320	0.251	0.29	0.273	0.391	0.025
4350	0.249	0.298	0.27	0.39	0.027
4380	0.284	0.304	0.249	0.39	0.025
4410	0.272	0.305	0.263	0.391	0.024
4440	0.262	0.305	0.266	0.391	0.025
4470	0.205	0.309	0.269	0.392	0.021
4500	0.235	0.312	0.27	0.395	0.018
4530	0.248	0.315	0.276	0.395	0.025
4560	0.254	0.318	0.278	0.397	0.027
4590	0.259	0.321	0.283	0.396	0.026
4620	0.26	0.323	0.278	0.397	0.026
4650	0.256	0.322	0.279	0.398	0.026
4680	0.258	0.325	0.28	0.399	0.024
4710	0.258	0.324	0.283	0.4	0.027
4740	0.26	0.325	0.284	0.401	0.029
4770	0.259	0.326	0.283	0.4	0.022
4800	0.263	0.327	0.287	0.403	0.023
4830	0.267	0.33	0.287	0.403	0.023
4860	0.265	0.33	0.292	0.406	0.024
4890	0.267	0.335	0.291	0.407	0.055
4920	0.268	0.335	0.29	0.406	0.048
4950	0.266	0.335	0.292	0.408	0.036
4980	0.266	0.336	0.29	0.408	0.03
5010	0.271	0.415	0.296	0.413	-0.004
5040	0.276	0.398	0.3	0.411	0.01
5070	0.277	0.385	0.304	0.413	0.018
5100	0.273	0.264	0.294	0.415	0.017
5130	0.273	0.299	0.304	0.415	0.01
5160	0.276	0.317	0.301	0.415	0.009
5190	0.272	0.329	0.296	0.417	0.011
5220	0.271	0.33	0.274	0.417	0.008

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
5250	0.301	0.331	0.285	0.418	0.005
5280	0.288	0.334	0.292	0.419	0.007
5310	0.281	0.34	0.293	0.419	0.005
5340	0.241	0.336	0.292	0.418	0.002
5370	0.259	0.337	0.291	0.419	0
5400	0.266	0.336	0.292	0.418	0.001
5430	0.268	0.338	0.293	0.42	-0.002
5460	0.271	0.338	0.295	0.416	-0.002
5490	0.275	0.34	0.295	0.418	0.001
5520	0.276	0.34	0.297	0.418	-0.004
5550	0.275	0.341	0.298	0.419	-0.005
5580	0.276	0.342	0.295	0.42	-0.007
5610	0.274	0.341	0.297	0.417	-0.009
5640	0.274	0.341	0.294	0.418	-0.01
5670	0.274	0.338	0.295	0.419	-0.015
5700	0.273	0.337	0.293	0.421	-0.016
5730	0.272	0.336	0.298	0.418	-0.015
5760	0.271	0.341	0.294	0.418	0.009
5790	0.274	0.341	0.295	0.419	-0.002
5820	0.274	0.341	0.299	0.419	-0.06
5850	0.278	0.411	0.27	0.42	-0.038
5880	0.279	0.393	0.271	0.42	-0.026
5910	0.281	0.38	0.272	0.42	-0.022
5940	0.282	0.375	0.276	0.421	-0.019
5970	0.281	0.281	0.285	0.422	-0.025
6000	0.281	0.309	0.28	0.425	-0.028
6030	0.28	0.324	0.274	0.424	-0.032
6060	0.278	0.33	0.246	0.424	-0.03
6090	0.31	0.331	0.259	0.425	-0.031
6120	0.296	0.336	0.266	0.421	-0.035
6150	0.289	0.339	0.269	0.425	-0.036
6180	0.275	0.341	0.272	0.426	-0.037
6210	0.259	0.343	0.273	0.425	-0.038
6240	0.271	0.341	0.272	0.422	-0.037
6270	0.276	0.342	0.274	0.422	-0.04
6300	0.275	0.341	0.274	0.419	-0.043
6330	0.276	0.341	0.273	0.419	-0.043
6360	0.275	0.341	0.273	0.418	-0.045
6390	0.275	0.339	0.272	0.419	-0.046
6420	0.281	0.343	0.279	0.418	-0.047
6450	0.277	0.343	0.278	0.421	-0.049
6480	0.278	0.342	0.275	0.419	-0.05
6510	0.276	0.34	0.274	0.418	-0.052
6540	0.275	0.338	0.274	0.417	-0.055

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
6570	0.274	0.336	0.275	0.416	-0.058
6600	0.278	0.339	0.275	0.417	-0.059
6630	0.278	0.341	0.277	0.417	-0.059
6660	0.278	0.344	0.279	0.415	-0.061
6690	0.278	0.342	0.278	0.417	-0.061
6720	0.279	0.34	0.276	0.417	-0.066
6750	0.276	0.339	0.277	0.418	-0.067
6780	0.276	0.339	0.275	0.417	-0.07
6810	0.277	0.337	0.279	0.417	-0.072
6840	0.274	0.339	0.278	0.418	-0.072
6870	0.277	0.337	0.281	0.419	-0.074
6900	0.277	0.338	0.28	0.416	-0.078
6930	0.276	0.339	0.281	0.414	-0.079
6960	0.275	0.336	0.279	0.417	-0.082
6990	0.277	0.337	0.281	0.415	-0.082
7020	0.279	0.341	0.282	0.414	-0.082
7050	0.279	0.345	0.286	0.415	-0.05
7080	0.281	0.346	0.287	0.416	-0.059
7110	0.283	0.347	0.289	0.415	-0.066
7140	0.286	0.42	0.295	0.418	-0.099
7170	0.288	0.401	0.3	0.419	-0.088
7200	0.288	0.389	0.301	0.419	-0.079
7230	0.288	0.275	0.295	0.421	-0.077
7260	0.286	0.309	0.307	0.421	-0.087
7290	0.285	0.326	0.299	0.421	-0.088
7320	0.275	0.333	0.29	0.422	-0.092
7350	0.305	0.339	0.28	0.419	-0.093
7380	0.313	0.344	0.293	0.422	-0.093
7410	0.305	0.35	0.301	0.422	-0.088
7440	0.244	0.354	0.302	0.426	-0.085
7470	0.277	0.355	0.304	0.425	-0.088
7500	0.287	0.357	0.305	0.425	-0.088
7530	0.292	0.358	0.304	0.426	-0.094
7560	0.296	0.359	0.309	0.428	-0.087
7590	0.295	0.36	0.308	0.43	-0.09
7620	0.295	0.36	0.307	0.428	-0.09
7650	0.297	0.359	0.306	0.429	-0.092
7680	0.293	0.359	0.309	0.429	-0.091
7710	0.292	0.361	0.308	0.43	-0.094
7740	0.295	0.363	0.31	0.432	-0.095
7770	0.297	0.361	0.311	0.433	-0.094
7800	0.296	0.362	0.311	0.432	-0.065
7830	0.297	0.367	0.311	0.433	-0.075
7860	0.301	0.368	0.316	0.434	-0.081

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RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
7890	0.304	0.367	0.314	0.435	-0.119
7920	0.304	0.441	0.321	0.437	-0.106
7950	0.308	0.424	0.328	0.438	-0.099
7980	0.31	0.416	0.327	0.437	-0.096
8010	0.311	0.324	0.34	0.441	-0.098
8040	0.314	0.348	0.333	0.441	-0.1
8070	0.317	0.367	0.334	0.443	-0.099
8100	0.32	0.378	0.31	0.448	-0.098
8130	0.346	0.374	0.316	0.446	-0.1
8160	0.33	0.374	0.319	0.448	-0.103
8190	0.317	0.373	0.321	0.446	-0.107
8220	0.271	0.371	0.319	0.447	-0.11
8250	0.293	0.37	0.319	0.449	-0.112
8280	0.3	0.374	0.324	0.446	-0.116
8310	0.303	0.374	0.323	0.446	-0.118
8340	0.306	0.376	0.323	0.448	-0.119
8370	0.306	0.377	0.323	0.445	-0.121
8400	0.314	0.376	0.327	0.449	-0.326
8430	0.316	0.382	0.33	0.449	-0.326
8460	0.318	0.386	0.333	0.453	-0.325
8490	0.315	0.385	0.329	0.451	-0.323
8520	0.322	0.39	0.339	0.455	-0.326
8550	0.327	0.393	0.343	0.455	-0.322
8580	0.333	0.397	0.346	0.457	-0.319
8610	0.332	0.405	0.349	0.458	-0.282
8640	0.338	0.408	0.322	0.461	-0.286
8670	0.342	0.411	0.321	0.465	-0.347
8700	0.345	0.49	0.329	0.465	-0.327
8730	0.348	0.47	0.332	0.469	-0.317
8760	0.347	0.459	0.336	0.47	-0.31
8790	0.347	0.358	0.348	0.472	-0.313
8820	0.35	0.389	0.343	0.47	-0.313
8850	0.35	0.405	0.335	0.472	-0.313
8880	0.35	0.411	0.337	0.473	-0.312
8910	0.35	0.414	0.318	0.469	-0.342
8940	0.353	0.42	0.33	0.476	-0.344
8970	0.396	0.423	0.336	0.48	-0.347
9000	0.381	0.425	0.339	0.482	-0.697
9030	0.371	0.429	0.343	0.482	-0.723
9060	0.307	0.43	0.344	0.487	-0.728
9090	0.345	0.432	0.344	0.489	-1.166
9120	0.358	0.432	0.347	0.491	-1.452
9150	0.363	0.437	0.349	0.494	-1.448
9180	0.368	0.437	0.352	0.494	-1.446

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RW-13 Dual Phase Recovery Test
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Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
9210	0.368	0.439	0.35	0.497	-1.443
9240	0.368	0.44	0.352	0.498	-1.441
9270	0.368	0.436	0.35	0.5	-1.44
9300	0.37	0.44	0.355	0.499	-1.442
9330	0.369	0.437	0.353	0.503	-1.441
9360	0.371	0.441	0.359	0.504	-1.44
9390	0.377	0.447	0.364	0.505	-1.436
9420	0.38	0.45	0.367	0.507	-1.432
9450	0.378	0.451	0.369	0.509	-1.427
9480	0.379	0.45	0.368	0.512	-1.428
9510	0.383	0.454	0.37	0.51	-1.425
9540	0.383	0.455	0.371	0.514	-1.422
9570	0.386	0.459	0.375	0.516	-1.42
9600	0.387	0.458	0.373	0.517	-1.418
9630	0.382	0.46	0.37	0.517	-1.418
9660	0.381	0.459	0.374	0.519	-1.419
9690	0.39	0.461	0.38	0.521	-1.417
9720	0.391	0.461	0.381	0.524	-1.413
9750	0.392	0.464	0.38	0.524	-1.414
9780	0.394	0.466	0.386	0.526	-1.41
9810	0.396	0.466	0.386	0.528	-1.408
9840	0.397	0.472	0.389	0.529	-1.407
9870	0.403	0.475	0.391	0.53	-1.405
9900	0.406	0.478	0.399	0.534	-1.402
9930	0.406	0.479	0.397	0.536	-1.396
9960	0.404	0.479	0.396	0.538	-1.397
9990	0.405	0.479	0.4	0.538	-1.393
10020	0.409	0.482	0.4	0.542	-1.391
10050	0.41	0.482	0.404	0.543	-1.39
10080	0.41	0.484	0.404	0.542	-1.391
10110	0.41	0.485	0.405	0.545	-1.387
10140	0.41	0.487	0.406	0.546	-1.388
10170	0.411	0.488	0.407	0.548	-1.389
10200	0.411	0.487	0.407	0.549	-1.386
10230	0.411	0.488	0.409	0.55	-1.385
10260	0.413	0.487	0.407	0.553	-1.384
10290	0.416	0.487	0.414	0.555	-1.383
10320	0.415	0.49	0.411	0.555	-1.354
10350	0.417	0.494	0.412	0.557	-1.359
10380	0.417	0.496	0.414	0.556	-1.362
10410	0.421	0.496	0.418	0.56	-1.416
10440	0.426	0.571	0.424	0.56	-1.393
10470	0.425	0.552	0.429	0.562	-1.373
10500	0.427	0.54	0.434	0.564	-1.367

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RW-13 Dual Phase Recovery Test
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Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
10530	0.428	0.533	0.433	0.565	-1.365
10560	0.428	0.443	0.44	0.568	-1.369
10590	0.429	0.474	0.431	0.568	-1.37
10620	0.426	0.487	0.424	0.571	-1.368
10650	0.427	0.495	0.414	0.57	-1.368
10680	0.461	0.497	0.413	0.572	-1.369
10710	0.447	0.502	0.42	0.573	-1.369
10740	0.436	0.504	0.424	0.574	-1.368
10770	0.39	0.504	0.422	0.574	-1.365
10800	0.409	0.502	0.423	0.573	-1.365
10830	0.416	0.503	0.423	0.574	-1.367
10860	0.419	0.506	0.428	0.573	-1.363
10890	0.421	0.503	0.426	0.573	-1.367
10920	0.422	0.506	0.426	0.575	-1.368
10950	0.423	0.504	0.427	0.574	-1.366
10980	0.424	0.503	0.428	0.575	-1.369
11010	0.422	0.506	0.429	0.576	-1.362
11040	0.421	0.504	0.429	0.576	-1.363
11070	0.422	0.505	0.429	0.576	-1.361
11100	0.421	0.505	0.429	0.577	-1.36
11130	0.423	0.504	0.43	0.577	-1.36
11160	0.423	0.506	0.43	0.577	-1.36
11190	0.424	0.505	0.431	0.578	-1.362
11220	0.425	0.506	0.431	0.578	-1.361
11250	0.425	0.505	0.433	0.578	-1.357
11280	0.427	0.508	0.431	0.58	-1.361
11310	0.427	0.508	0.436	0.579	-1.358
11340	0.427	0.507	0.433	0.581	-1.36
11370	0.426	0.507	0.432	0.581	-1.361
11400	0.427	0.509	0.432	0.581	-1.36
11430	0.426	0.507	0.434	0.581	-1.355
11460	0.425	0.507	0.434	0.58	-1.356
11490	0.426	0.509	0.436	0.581	-1.355
11520	0.427	0.507	0.437	0.581	-1.354
11550	0.426	0.503	0.437	0.581	-1.355
11580	0.425	0.505	0.435	0.581	-1.355
11610	0.423	0.504	0.436	0.581	-1.357
11640	0.426	0.505	0.436	0.582	-1.354
11670	0.428	0.507	0.438	0.583	-1.352
11700	0.429	0.51	0.437	0.583	-1.352
11730	0.43	0.511	0.438	0.583	-1.351
11760	0.432	0.511	0.442	0.584	-1.351
11790	0.43	0.507	0.441	0.583	-1.351
11820	0.431	0.51	0.439	0.583	-1.353

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
11850	0.428	0.507	0.44	0.585	-1.35
11880	0.43	0.507	0.44	0.583	-1.353
11910	0.429	0.51	0.437	0.584	-1.355
11940	0.432	0.509	0.438	0.584	-1.351
11970	0.428	0.508	0.439	0.586	-1.352
12000	0.431	0.51	0.44	0.585	-1.353
12030	0.436	0.514	0.445	0.586	-1.349
12060	0.438	0.516	0.446	0.588	-1.349
12090	0.438	0.519	0.449	0.587	-1.33
12120	0.44	0.521	0.451	0.589	-1.317
12150	0.439	0.522	0.453	0.588	-1.323
12180	0.446	0.526	0.456	0.59	-1.376
12210	0.449	0.601	0.464	0.591	-1.354
12240	0.45	0.582	0.468	0.594	-1.343
12270	0.452	0.571	0.467	0.594	-1.339
12300	0.449	0.476	0.479	0.594	-1.34
12330	0.449	0.501	0.466	0.596	-1.34
12360	0.449	0.514	0.463	0.598	-1.34
12390	0.45	0.522	0.45	0.598	-1.338
12420	0.451	0.526	0.45	0.598	-1.338
12450	0.495	0.532	0.464	0.602	-1.335
12480	0.482	0.537	0.47	0.603	-1.329
12510	0.474	0.545	0.47	0.604	-1.326
12540	0.417	0.545	0.473	0.606	-1.324
12570	0.444	0.547	0.471	0.609	-1.318
12600	0.455	0.545	0.472	0.608	-1.318
12630	0.462	0.547	0.474	0.611	-1.315
12660	0.464	0.548	0.474	0.611	-1.315
12690	0.468	0.549	0.476	0.613	-1.315
12720	0.467	0.554	0.478	0.613	-1.315
12750	0.467	0.55	0.479	0.616	-1.311
12780	0.469	0.553	0.478	0.616	-1.313
12810	0.469	0.554	0.478	0.616	-1.308
12840	0.469	0.553	0.478	0.616	-1.309
12870	0.47	0.551	0.479	0.619	-1.311
12900	0.468	0.554	0.476	0.618	-1.311
12930	0.47	0.553	0.482	0.619	-1.308
12960	0.469	0.551	0.478	0.62	-1.309
12990	0.467	0.55	0.477	0.621	-1.309
13020	0.466	0.547	0.476	0.621	-1.308
13050	0.469	0.551	0.476	0.622	-1.309
13080	0.47	0.552	0.477	0.622	-1.308
13110	0.472	0.555	0.479	0.623	-1.308
13140	0.471	0.554	0.478	0.624	-1.312

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
13170	0.472	0.556	0.481	0.624	-1.311
13200	0.476	0.557	0.482	0.624	-1.307
13230	0.48	0.559	0.485	0.626	-1.304
13260	0.483	0.564	0.488	0.628	-1.3
13290	0.485	0.568	0.49	0.63	-1.299
13320	0.489	0.57	0.496	0.631	-1.296
13350	0.488	0.573	0.494	0.632	-1.294
13380	0.485	0.57	0.492	0.634	-1.294
13410	0.483	0.566	0.492	0.635	-1.294
13440	0.48	0.563	0.485	0.634	-1.299
13470	0.479	0.558	0.484	0.636	-1.298
13500	0.477	0.557	0.483	0.635	-1.302
13530	0.475	0.555	0.478	0.634	-1.305
13560	0.474	0.554	0.48	0.635	-1.307
13590	0.477	0.557	0.481	0.634	-1.305
13620	0.479	0.561	0.484	0.634	-1.305
13650	0.479	0.561	0.483	0.635	-1.305
13680	0.478	0.559	0.482	0.635	-1.308
13710	0.481	0.559	0.488	0.636	-1.304
13740	0.479	0.561	0.487	0.637	-1.306
13770	0.479	0.559	0.49	0.636	-1.301
13800	0.481	0.56	0.486	0.636	-1.305
13830	0.481	0.561	0.484	0.637	-1.304
13860	0.482	0.561	0.49	0.637	-1.304
13890	0.484	0.562	0.491	0.635	-1.302
13920	0.481	0.563	0.49	0.635	-1.301
13950	0.485	0.563	0.494	0.637	-1.298
13980	0.485	0.565	0.494	0.639	-1.302
14010	0.487	0.568	0.496	0.64	-1.27
14040	0.486	0.568	0.494	0.639	-1.277
14070	0.486	0.566	0.494	0.639	-1.335
14100	0.488	0.64	0.499	0.641	-1.314
14130	0.489	0.621	0.502	0.641	-1.304
14160	0.489	0.607	0.502	0.643	-1.297
14190	0.487	0.498	0.496	0.641	-1.298
14220	0.484	0.529	0.502	0.642	-1.301
14250	0.484	0.541	0.496	0.641	-1.303
14280	0.483	0.548	0.471	0.64	-1.305
14310	0.514	0.551	0.481	0.64	-1.304
14340	0.498	0.554	0.485	0.641	-1.309
14370	0.49	0.555	0.487	0.64	-1.309
14400	0.449	0.556	0.486	0.638	-1.308
14430	0.467	0.555	0.483	0.638	-1.31
14460	0.476	0.554	0.483	0.634	-1.311

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
14490	0.482	0.553	0.488	0.633	-1.311
14520	0.487	0.557	0.486	0.634	-1.326
14550	0.485	0.556	0.488	0.633	-1.333
14580	0.487	0.558	0.489	0.634	-1.333
14610	0.489	0.558	0.49	0.633	-1.333
14640	0.489	0.56	0.49	0.635	-1.333
14670	0.491	0.562	0.492	0.636	-1.371
14700	0.493	0.564	0.495	0.636	-1.37
14730	0.499	0.57	0.5	0.638	-1.366
14760	0.502	0.574	0.504	0.637	-1.361
14790	0.505	0.578	0.504	0.641	-1.361
14820	0.506	0.579	0.508	0.643	-1.36
14850	0.507	0.58	0.509	0.645	-1.355
14880	0.506	0.582	0.508	0.646	-1.354
14910	0.509	0.583	0.507	0.647	-1.354
14940	0.508	0.582	0.509	0.647	-1.352
14970	0.752	0.583	0.487	0.648	-1.354
15000	0.51	0.584	0.487	0.649	-1.352
15030	0.513	0.59	0.491	0.651	-1.347
15060	0.511	0.588	0.49	0.653	-1.347
15090	0.514	0.588	0.488	0.655	-1.346
15120	0.512	0.586	0.488	0.654	-1.345
15150	0.51	0.585	0.488	0.654	-1.35
15180	0.51	0.585	0.486	0.709	-1.348
15210.17	0.509	0.582	0.488	0.648	-1.349
15240	0.513	0.584	0.489	0.652	-1.346
15270	0.513	0.584	0.49	0.654	-1.348
15300	0.511	0.582	0.49	0.654	-1.345
15330	0.511	0.581	0.488	0.653	-1.348
15360	0.51	0.578	0.491	0.642	-1.345
15390	0.506	0.577	0.487	0.653	-1.349
15420	0.506	0.576	0.485	0.653	-1.351
15450	0.507	0.579	0.486	0.652	-1.35
15480	0.506	0.579	0.489	0.653	-1.348
15510	0.507	0.578	0.491	0.653	-1.348
15540	0.508	0.578	0.494	0.652	-1.345
15570	0.507	0.578	0.492	0.653	-1.345
15600	0.506	0.578	0.492	0.653	-1.345
15630	0.505	0.577	0.49	0.654	-1.348
15660	0.506	0.577	0.491	0.653	-1.345
15690	0.507	0.576	0.491	0.653	-1.348
15720	0.51	0.58	0.493	0.653	-1.345
15750	0.51	0.582	0.495	0.653	-1.344
15780	0.511	0.584	0.495	0.655	-1.341

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
15810	0.512	0.586	0.498	0.654	-1.341
15840	0.514	0.587	0.501	0.655	-1.339
15870	0.514	0.588	0.496	0.657	-1.339
15900	0.517	0.59	0.497	0.661	-1.337
15930	0.518	0.591	0.496	0.66	-1.305
15960	0.518	0.59	0.5	0.662	-1.311
15990	0.519	0.592	0.501	0.662	-1.319
16020	0.52	0.593	0.503	0.661	-1.367
16050	0.519	0.657	0.509	0.662	-1.353
16080	0.521	0.641	0.505	0.664	-1.342
16110	0.522	0.625	0.508	0.663	-1.338
16140	0.519	0.516	0.503	0.663	-1.335
16170	0.516	0.553	0.51	0.663	-1.34
16200	0.516	0.569	0.503	0.664	-1.339
16230	0.513	0.576	0.503	0.662	-1.34
16260	0.516	0.578	0.479	0.663	-1.344
16290	0.538	0.582	0.493	0.663	-1.342
16320	0.528	0.587	0.502	0.665	-1.338
16350	0.522	0.588	0.507	0.665	-1.336
16380	0.472	0.592	0.505	0.664	-1.333
16410	0.492	0.59	0.501	0.665	-1.334
16440	0.5	0.59	0.502	0.662	-1.336
16470	0.506	0.59	0.506	0.662	-1.338
16500	0.509	0.591	0.504	0.662	-1.336
16530	0.506	0.589	0.502	0.664	-1.337
16560	0.508	0.589	0.503	0.664	-1.339
16590	0.505	0.584	0.498	0.662	-1.338
16620	0.504	0.586	0.502	0.663	-1.341
16650	0.507	0.585	0.498	0.661	-1.341
16680	0.506	0.585	0.503	0.661	-1.338
16710	0.505	0.585	0.501	0.66	-1.338
16740	0.508	0.586	0.503	0.661	-1.339
16770	0.503	0.585	0.504	0.66	-1.338
16800	0.508	0.584	0.504	0.66	-1.337
16830	0.504	0.587	0.503	0.659	-1.338
16860	0.502	0.585	0.504	0.66	-1.337
16890	0.502	0.582	0.502	0.659	-1.338
16920	0.503	0.581	0.504	0.658	-1.336
16950	0.502	0.581	0.505	0.658	-1.338
16980	0.502	0.579	0.504	0.659	-1.334
17010	0.501	0.578	0.506	0.659	-1.339
17040	0.502	0.583	0.507	0.658	-1.335
17070	0.503	0.582	0.504	0.658	-1.332
17100	0.503	0.586	0.507	0.659	-1.333

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
17130	0.505	0.584	0.509	0.659	-1.331
17160	0.503	0.586	0.511	0.659	-1.33
17190	0.505	0.584	0.51	0.659	-1.331
17220	0.506	0.586	0.511	0.659	-1.332
17250	0.505	0.587	0.511	0.66	-1.332
17280	0.505	0.589	0.514	0.66	-1.327
17310	0.504	0.586	0.508	0.662	-1.328
17340	0.505	0.586	0.512	0.661	-1.333
17370	0.507	0.583	0.512	0.659	-1.329
17400	0.506	0.586	0.512	0.661	-1.328
17430	0.503	0.586	0.512	0.661	-1.331
17460	0.504	0.583	0.511	0.661	-1.33
17490	0.503	0.583	0.508	0.659	-1.33
17520	0.5	0.582	0.507	0.66	-1.308
17550	0.501	0.581	0.51	0.66	-1.308
17580	0.501	0.583	0.508	0.659	-1.317
17610	0.499	0.579	0.508	0.657	-1.363
17640	0.499	0.649	0.511	0.656	-1.346
17670	0.502	0.621	0.512	0.655	-1.337
17700	0.502	0.619	0.494	0.655	-1.332
17730	0.501	0.518	0.488	0.655	-1.332
17760	0.502	0.547	0.5	0.657	-1.338
17790	0.502	0.561	0.494	0.655	-1.332
17820	0.501	0.568	0.47	0.654	-1.331
17850	0.534	0.57	0.482	0.655	-1.335
17880	0.519	0.575	0.488	0.657	-1.334
17910	0.509	0.576	0.492	0.654	-1.332
17940	0.466	0.578	0.487	0.638	-1.333
17970	0.492	0.577	0.492	0.637	-1.333
18000	0.501	0.581	0.492	0.635	-1.33
18030	0.505	0.582	0.497	0.638	-1.329
18060	0.511	0.586	0.499	0.639	-1.325
18090	0.514	0.588	0.5	0.641	-1.322
18120	0.515	0.591	0.503	0.642	-1.318
18150	0.517	0.591	0.504	0.645	-1.321
18180	0.519	0.593	0.502	0.645	-1.318
18210	0.518	0.592	0.505	0.648	-1.317
18240	0.516	0.594	0.506	0.648	-1.316
18270	0.517	0.592	0.506	0.649	-1.317
18300	0.517	0.595	0.504	0.649	-1.318
18330	0.516	0.594	0.507	0.649	-1.316
18360	0.519	0.596	0.506	0.651	-1.317
18390	0.521	0.594	0.508	0.65	-1.317
18420	0.521	0.595	0.508	0.652	-1.316

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RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
18450	0.521	0.595	0.507	0.651	-1.318
18480	0.518	0.598	0.506	0.651	-1.315
18510	0.516	0.59	0.505	0.651	-1.317
18540	0.517	0.59	0.504	0.653	-1.322
18570	0.517	0.593	0.504	0.652	-1.32
18600	0.516	0.589	0.504	0.651	-1.318
18630	0.515	0.589	0.505	0.651	-1.321
18660	0.515	0.589	0.504	0.652	-1.322
18690	0.514	0.587	0.501	0.65	-1.323
18720	0.515	0.587	0.502	0.651	-1.321
18750	0.514	0.588	0.501	0.65	-1.327
18780	0.514	0.588	0.498	0.65	-1.324
18810	0.516	0.586	0.502	0.648	-1.322
18840	0.515	0.589	0.503	0.649	-1.322
18870	0.516	0.59	0.505	0.649	-1.323
18900	0.516	0.59	0.507	0.649	-1.319
18930	0.513	0.592	0.508	0.65	-1.319
18960	0.515	0.592	0.508	0.648	-1.315
18990	0.518	0.595	0.512	0.65	-1.315
19020	0.52	0.595	0.512	0.651	-1.314
19050	0.522	0.598	0.515	0.651	-1.314
19080	0.523	0.599	0.515	0.653	-1.311
19110	0.525	0.597	0.515	0.655	-1.311
19140	0.527	0.602	0.517	0.656	-1.311
19170	0.53	0.603	0.52	0.656	-1.311
19200	0.529	0.606	0.521	0.657	-1.306
19230	0.531	0.605	0.523	0.658	-1.306
19260	0.531	0.607	0.523	0.658	-1.304
19290	0.534	0.609	0.527	0.66	-1.304
19320	0.534	0.608	0.532	0.66	-1.301
19350	0.533	0.611	0.53	0.662	-1.296
19380	0.537	0.614	0.532	0.662	-1.3
19410	0.535	0.611	0.532	0.665	-1.296
19440	0.535	0.614	0.531	0.665	-1.293
19470	0.535	0.61	0.531	0.666	-1.296
19500	0.534	0.611	0.531	0.666	-1.297
19530	0.536	0.614	0.532	0.67	-1.266
19560	0.534	0.611	0.532	0.67	-1.27
19590	0.535	0.609	0.53	0.671	-1.322
19620	0.535	0.675	0.533	0.671	-1.308
19650	0.535	0.656	0.535	0.67	-1.301
19680	0.534	0.644	0.534	0.671	-1.296
19710	0.532	0.551	0.544	0.67	-1.299
19740	0.53	0.574	0.533	0.67	-1.302

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RW-13 Dual Phase Recovery Test
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Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
19770	0.53	0.587	0.531	0.668	-1.303
19800	0.558	0.593	0.513	0.669	-1.303
19830	0.553	0.602	0.526	0.671	-1.302
19860	0.542	0.602	0.531	0.667	-1.299
19890	0.483	0.606	0.53	0.669	-1.299
19920	0.509	0.605	0.526	0.669	-1.299
19950	0.52	0.607	0.528	0.667	-1.302
19980	0.525	0.607	0.528	0.668	-1.305
20010	0.526	0.603	0.526	0.667	-1.302
20040	0.527	0.604	0.526	0.666	-1.303
20070	0.531	0.607	0.525	0.669	-1.301
20100	0.529	0.606	0.529	0.669	-1.301
20130	0.531	0.607	0.529	0.668	-1.297
20160	0.533	0.612	0.53	0.67	-1.295
20190	0.531	0.609	0.53	0.67	-1.297
20220	0.532	0.61	0.53	0.67	-1.298
20250	0.533	0.611	0.513	0.67	-1.296
20280	0.536	0.612	0.516	0.672	-1.299
20310	0.539	0.616	0.518	0.672	-1.293
20340	0.542	0.62	0.52	0.673	-1.29
20370	0.541	0.621	0.522	0.674	-1.29
20400	0.544	0.622	0.525	0.675	-1.287
20430	0.546	0.625	0.523	0.676	-1.287
20460	0.542	0.62	0.52	0.678	-1.289
20490.312	0.539	0.617	0.518	0.676	-1.289
20520	0.536	0.615	0.518	0.676	-1.293
20550	0.534	0.614	0.514	0.677	-1.294
20580	0.532	0.609	0.515	0.675	-1.288
20610	0.53	0.61	0.51	0.673	-1.295
20640	0.528	0.604	0.509	0.671	-1.301
20670	0.525	0.605	0.509	0.668	-1.298
20700	0.527	0.602	0.51	0.668	-1.298
20730	0.527	0.6	0.509	0.666	-1.297
20760	0.525	0.601	0.511	0.665	-1.301
20790	0.523	0.6	0.509	0.666	-1.303
20820	0.52	0.596	0.506	0.663	-1.304
20850	0.518	0.595	0.503	0.662	-1.307
20880	0.517	0.592	0.504	0.659	-1.312
20910	0.518	0.588	0.5	0.658	-1.313
20940	0.516	0.59	0.5	0.657	-1.313
20970	0.516	0.591	0.5	0.655	-1.316
21000	0.513	0.587	0.495	0.653	-1.317
21030	0.515	0.586	0.495	0.653	-1.323
21060	0.516	0.587	0.497	0.65	-1.322

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
21090	0.515	0.587	0.496	0.65	-1.32
21120	0.514	0.585	0.496	0.65	-1.322
21150	0.515	0.587	0.495	0.648	-1.326
21180	0.516	0.585	0.493	0.648	-1.327
21210	0.516	0.587	0.492	0.648	-1.325
21240	0.515	0.588	0.494	0.649	-1.325
21270	0.515	0.586	0.492	0.648	-1.294
21300	0.515	0.588	0.494	0.648	-1.3
21330	0.517	0.59	0.495	0.647	-1.305
21360	0.517	0.59	0.494	0.647	-1.308
21390	0.518	0.667	0.496	0.647	-1.348
21420	0.519	0.651	0.501	0.647	-1.337
21450	0.52	0.635	0.5	0.646	-1.33
21480	0.523	0.523	0.509	0.647	-1.33
21510	0.52	0.556	0.503	0.646	-1.333
21540	0.518	0.568	0.499	0.645	-1.33
21570	0.518	0.571	0.495	0.647	-1.329
21600	0.552	0.58	0.487	0.645	-1.331
21630	0.538	0.582	0.498	0.644	-1.327
21660	0.528	0.584	0.503	0.644	-1.326
21690	0.52	0.586	0.503	0.644	-1.325
21720	0.515	0.584	0.501	0.644	-1.325
21750	0.515	0.587	0.505	0.645	-1.325
21780	0.515	0.587	0.507	0.644	-1.322
21810	0.515	0.588	0.507	0.646	-1.324
21840	0.513	0.589	0.503	0.645	-1.32
21870	0.512	0.588	0.506	0.645	-1.319
21900	0.513	0.588	0.507	0.644	-1.321
21930	0.514	0.59	0.493	0.645	-1.32
21960	0.515	0.592	0.496	0.646	-1.319
21990	0.514	0.594	0.494	0.656	-1.317
22020	0.514	0.594	0.495	0.747	-1.317
22050	0.515	0.594	0.494	0.647	-1.317
22080	0.515	0.592	0.496	0.646	-1.316
22110	0.513	0.593	0.496	0.649	-1.318
22140	0.515	0.592	0.496	0.648	-1.32
22170	0.516	0.594	0.493	0.654	-1.32
22200	0.516	0.596	0.496	0.654	-1.319
22230	0.519	0.596	0.499	0.653	-1.317
22260	0.519	0.596	0.501	0.655	-1.314
22290	0.519	0.596	0.5	0.655	-1.314
22320	0.519	0.598	0.499	0.655	-1.313
22350	0.517	0.597	0.499	0.655	-1.315
22380	0.516	0.594	0.499	0.656	-1.318

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
22410	0.518	0.596	0.501	0.656	-1.315
22440	0.518	0.597	0.503	0.656	-1.315
22470	0.519	0.596	0.503	0.656	-1.314
22500	0.521	0.599	0.51	0.657	-1.312
22530	0.521	0.602	0.507	0.659	-1.311
22560	0.521	0.599	0.503	0.659	-1.31
22590	0.523	0.602	0.509	0.66	-1.31
22620	0.525	0.603	0.517	0.661	-1.308
22650	0.524	0.605	0.509	0.662	-1.308
22680	0.525	0.607	0.508	0.662	-1.307
22710	0.524	0.605	0.508	0.663	-1.31
22740	0.521	0.603	0.51	0.663	-1.307
22770	0.521	0.603	0.51	0.663	-1.308
22800	0.522	0.603	0.509	0.663	-1.306
22830	0.52	0.602	0.508	0.662	-1.31
22860	0.524	0.606	0.51	0.662	-1.305
22890	0.522	0.604	0.509	0.664	-1.307
22920	0.521	0.604	0.51	0.664	-1.307
22950	0.483	0.604	0.508	0.664	-1.308
22980	0.507	0.6	0.505	0.664	-1.31
23010	0.517	0.6	0.505	0.662	-1.301
23040	0.522	0.6	0.504	0.663	-1.287
23070	0.525	0.603	0.507	0.664	-1.292
23100	0.527	0.603	0.504	0.663	-1.343
23130	0.526	0.672	0.51	0.663	-1.327
23160	0.527	0.649	0.513	0.663	-1.315
23190	0.527	0.634	0.512	0.661	-1.311
23220	0.522	0.548	0.514	0.661	-1.315
23250	0.523	0.57	0.508	0.661	-1.317
23280	0.558	0.581	0.497	0.66	-1.319
23310	0.543	0.586	0.503	0.661	-1.319
23340	0.533	0.591	0.508	0.658	-1.317
23370	0.478	0.592	0.505	0.658	-1.315
23400	0.501	0.596	0.505	0.657	-1.317
23430	0.512	0.594	0.507	0.659	-1.314
23460	0.516	0.596	0.507	0.658	-1.317
23490	0.516	0.596	0.504	0.658	-1.318
23520	0.517	0.597	0.505	0.657	-1.315
23550	0.519	0.597	0.506	0.658	-1.317
23580	0.52	0.598	0.506	0.658	-1.313
23610	0.519	0.597	0.508	0.659	-1.315
23640	0.522	0.597	0.51	0.658	-1.314
23670	0.527	0.604	0.514	0.659	-1.314
23700	0.529	0.605	0.514	0.661	-1.308

Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Time (seconds)	RW-4	RW-7	RW-6	RW-10	RW-2
23730	0.529	0.606	0.514	0.663	-1.31
23760	0.531	0.608	0.516	0.664	-1.306
23790	0.535	0.616	0.519	0.666	-1.306
23820	0.536	0.618	0.527	0.667	-1.299
23850	0.541	0.618	0.525	0.669	-1.301
23880	0.54	0.623	0.528	0.67	-1.301
23910	0.54	0.621	0.527	0.673	-1.298
23940	0.543	0.627	0.532	0.675	-1.297
23970	0.545	0.626	0.535	0.676	-1.293
24000	0.55	0.631	0.539	0.678	-1.287
24030	0.55	0.632	0.538	0.68	-1.289
24060	0.55	0.636	0.54	0.682	-1.285
24090	0.553	0.637	0.546	0.685	-1.284
24120	0.552	0.634	0.543	0.685	-1.282
24150	0.548	0.631	0.544	0.685	-1.281
24180	0.546	0.63	0.54	0.685	-1.284
24210	0.542	0.624	0.54	0.686	-1.283
24240	0.507	0.594	0.498	0.685	-1.294
24270	0.436	0.518	0.431	0.664	-1.336
Distance from RW-13	21	21	23	28	27

Table 6
Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Vacuum Readings (Inch H2O)

Time	RW-13	RW-2	RW-4	RW-6	RW-7	RW-10
0	129.15	0.15	0.85	0.5	1.6	0.5
10	129.15	0.5	0.85	0.7	2.05	0.5
20	129.15	0.6	0.85	0.7	2.2	0.5
35	129.15	0.6	0.8	0.75	2.2	0.09
50	129.15	0.6	1	0.75	2.4	0.1
65	129.15	0.65	1	0.7	2.4	0.09
80	129.15	0.65	1.05	0.7	2.4	0.1
95	129.15	0.65	0.95	0.7	2.4	0.09
110	129.15	0.65	1	0.7	2.35	0.09
125	129.15	0.65	1	0.7	2.4	0.09
155	129.15	0.65	1.1	0.75	2.45	0.09
185	129.15	0.65	1.15	0.75	2.5	0.1
215	129.15	0.65	1.2	0.7	2.5	0.09
245	129.15	0.65	1.15	0.75	2.4	0.09
275	129.15	0.7	1.05	0.7	2.3	0.1
305	129.15	0.65	1	0.65	2.35	0.1
335	129.15	0.65	1.05	0.65	2.4	0.11
365	129.15	0.7	1.1	0.65	2.35	0.09
395	129.15	0.65	1.1	0.6	2.3	0.08
Average	129.15	0.61	1.01	0.69	2.31	0.16
Distance from RW-13	0.01	21	21	23	27	28

Table 7
Royal Farms Store No. 96
RW-13 Dual Phase Recovery Test
Test Conducted 1-16-2012

Vacuum Pump and Effluent Stack Measurements

Elapsed Time (min)	Air Flow (cfm)	PID (PPM)	Vacuum (in-Hg)
Flow Rate = 3 gpm			
0	65.00	654.00	9.50
9	57.00	648.00	9.50
19	50.00	649.00	9.50
29	59.00	658.00	9.50
49	52.00	649.00	9.50
79	51.00	675.00	9.50
139	48.00	643.00	10.00
199	57.00	652.00	9.50
259	49.00	642.00	9.50
319	49.00	647.00	9.50
379	56.00	640.00	9.50

gpm - Gallons Per Minute

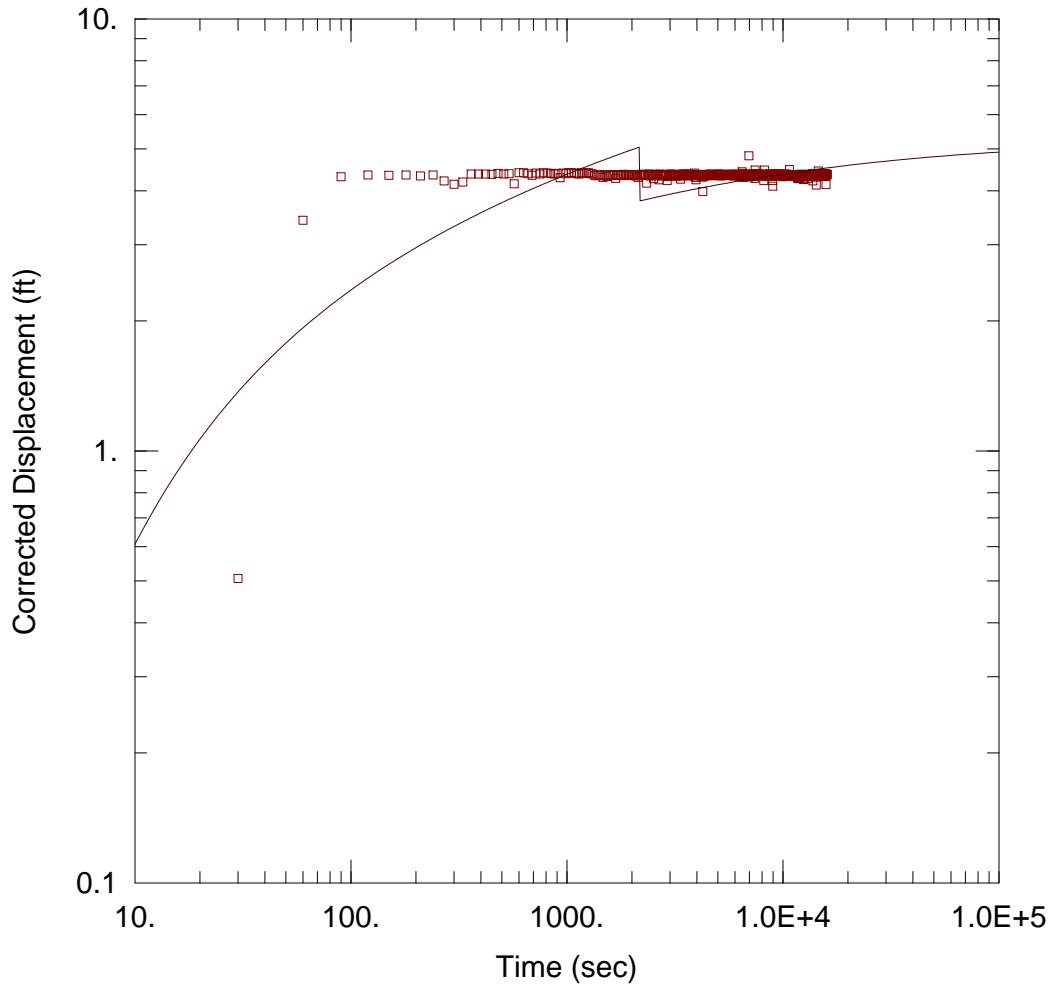
cfm - Cubic Feet Per Minute

PID - Photoionization Detector

ppm - Parts Per Million

in-Hg - Inches of Mercury

APPENDIX E



WELL TEST ANALYSIS

Data Set: C:\...\Constant Rate Pumping Test RW-13 This Final.aqt
 Date: 01/28/12 Time: 23:24:25

PROJECT INFORMATION

Company: AEC
 Client: Royal Farms
 Project: 05-056
 Location: North East, MD
 Test Well: RW-13
 Test Date: 1/13/12

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
RW-13	0	0	□ RW-13	0	0

SOLUTION

Aquifer Model: Unconfined Solution Method: Theis
 $T = 0.01166 \text{ ft}^2/\text{sec}$ $S = 0.7083$
 $Kz/Kr = 1.$ $b = 10.1 \text{ ft}$

Data Set: C:\Users\Jeff\Desktop\Work Folder\Store 096 - 500 Mechanics Valley Road, North East\Pilot Study - Jan
 Date: 01/28/12
 Time: 23:20:27

PROJECT INFORMATION

Company: AEC
 Client: Royal Farms
 Project: 05-056
 Location: North East, MD
 Test Date: 1/13/12
 Test Well: RW-13

AQUIFER DATA

Saturated Thickness: 10.1 ft
 Anisotropy Ratio (Kz/Kr): 1.

PUMPING WELL DATA

No. of pumping wells: 1

Pumping Well No. 1: RW-13

X Location: 0. ft
 Y Location: 0. ft

Casing Radius: 0.33 ft
 Well Radius: 0.52 ft

Fully Penetrating Well

No. of pumping periods: 535

Pumping Period Data			
Time (sec)	Rate (cu. ft/sec)	Time (sec)	Rate (cu. ft/sec)
0.	0.13	8040.	0.13
30.	0.13	8070.	0.13
60.	0.13	8100.	0.13
90.	0.13	8130.	0.13
120.	0.13	8160.	0.13
150.	0.13	8190.	0.13
180.	0.13	8220.	0.13
210.	0.13	8250.	0.13
240.	0.13	8280.	0.13
270.	0.13	8310.	0.13
300.	0.13	8340.	0.13
330.	0.13	8370.	0.13
360.	0.13	8400.	0.13
390.	0.13	8430.	0.13
420.	0.13	8460.	0.13
450.	0.13	8490.	0.13
480.	0.13	8520.	0.13
510.	0.13	8550.	0.13
540.	0.13	8580.	0.13
570.	0.13	8610.	0.13
600.	0.13	8640.	0.13
630.	0.13	8670.	0.13
660.	0.13	8700.	0.13
690.	0.13	8730.	0.13
720.	0.13	8760.	0.13
750.	0.13	8790.	0.13
780.	0.13	8820.	0.13
810.	0.13	8850.	0.13
840.	0.13	8880.	0.13
870.	0.13	8910.	0.13
900.	0.13	8940.	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
930.	0.13	8970.	0.13
960.	0.13	9000.	0.13
990.	0.13	9030.	0.13
1020.	0.13	9060.	0.13
1050.	0.13	9090.	0.13
1080.	0.13	9120.	0.13
1110.	0.13	9150.	0.13
1140.	0.13	9180.	0.13
1170.	0.13	9210.	0.13
1200.	0.13	9240.	0.13
1230.	0.13	9270.	0.13
1260.	0.13	9300.	0.13
1290.	0.13	9330.	0.13
1320.	0.13	9360.	0.13
1350.	0.13	9390.	0.13
1380.	0.13	9420.	0.13
1410.	0.13	9450.	0.13
1440.	0.13	9480.	0.13
1470.	0.13	9510.	0.13
1500.	0.13	9540.	0.13
1530.	0.13	9570.	0.13
1560.	0.13	9600.	0.13
1590.	0.13	9630.	0.13
1620.	0.13	9660.	0.13
1650.	0.13	9690.	0.13
1680.	0.13	9720.	0.13
1710.	0.13	9750.	0.13
1740.	0.13	9780.	0.13
1770.	0.13	9810.	0.13
1800.	0.13	9840.	0.13
1830.	0.13	9870.	0.13
1860.	0.13	9900.	0.13
1890.	0.13	9930.	0.13
1920.	0.13	9960.	0.13
1950.	0.13	9990.	0.13
1980.	0.13	1.002E+4	0.13
2010.	0.13	1.005E+4	0.13
2040.	0.13	1.008E+4	0.13
2070.	0.13	1.011E+4	0.13
2100.	0.13	1.014E+4	0.13
2130.	0.13	1.017E+4	0.13
2160.	0.13	1.02E+4	0.13
2190.	0.13	1.023E+4	0.13
2220.	0.13	1.026E+4	0.13
2250.	0.13	1.029E+4	0.13
2280.	0.13	1.032E+4	0.13
2310.	0.13	1.035E+4	0.13
2340.	0.13	1.038E+4	0.13
2370.	0.13	1.041E+4	0.13
2400.	0.13	1.044E+4	0.13
2430.	0.13	1.047E+4	0.13
2460.	0.13	1.05E+4	0.13
2490.	0.13	1.053E+4	0.13
2520.	0.13	1.056E+4	0.13
2550.	0.13	1.059E+4	0.13
2580.	0.13	1.062E+4	0.13
2610.	0.13	1.065E+4	0.13
2640.	0.13	1.068E+4	0.13
2670.	0.13	1.071E+4	0.13
2700.	0.13	1.074E+4	0.13
2730.	0.13	1.077E+4	0.13
2760.	0.13	1.08E+4	0.13
2790.	0.13	1.083E+4	0.13
2820.	0.13	1.086E+4	0.13
2850.	0.13	1.089E+4	0.13
2880.	0.13	1.092E+4	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
2910.	0.13	1.095E+4	0.13
2940.	0.13	1.098E+4	0.13
2970.	0.13	1.101E+4	0.13
3000.	0.13	1.104E+4	0.13
3030.	0.13	1.107E+4	0.13
3060.	0.13	1.11E+4	0.13
3090.	0.13	1.113E+4	0.13
3120.	0.13	1.116E+4	0.13
3150.	0.13	1.119E+4	0.13
3180.	0.13	1.122E+4	0.13
3210.	0.13	1.125E+4	0.13
3240.	0.13	1.128E+4	0.13
3270.	0.13	1.131E+4	0.13
3300.	0.13	1.134E+4	0.13
3330.	0.13	1.137E+4	0.13
3360.	0.13	1.14E+4	0.13
3390.	0.13	1.143E+4	0.13
3420.	0.13	1.146E+4	0.13
3450.	0.13	1.149E+4	0.13
3480.	0.13	1.152E+4	0.13
3510.	0.13	1.155E+4	0.13
3540.	0.13	1.158E+4	0.13
3570.	0.13	1.161E+4	0.13
3600.	0.13	1.164E+4	0.13
3630.	0.13	1.167E+4	0.13
3660.	0.13	1.17E+4	0.13
3690.	0.13	1.173E+4	0.13
3720.	0.13	1.176E+4	0.13
3750.	0.13	1.179E+4	0.13
3780.	0.13	1.182E+4	0.13
3810.	0.13	1.185E+4	0.13
3840.	0.13	1.188E+4	0.13
3870.	0.13	1.191E+4	0.13
3900.	0.13	1.194E+4	0.13
3930.	0.13	1.197E+4	0.13
3960.	0.13	1.2E+4	0.13
3990.	0.13	1.203E+4	0.13
4020.	0.13	1.206E+4	0.13
4050.	0.13	1.209E+4	0.13
4080.	0.13	1.212E+4	0.13
4110.	0.13	1.215E+4	0.13
4140.	0.13	1.218E+4	0.13
4170.	0.13	1.221E+4	0.13
4200.	0.13	1.224E+4	0.13
4230.	0.13	1.227E+4	0.13
4260.	0.13	1.23E+4	0.13
4290.	0.13	1.233E+4	0.13
4320.	0.13	1.236E+4	0.13
4350.	0.13	1.239E+4	0.13
4380.	0.13	1.242E+4	0.13
4410.	0.13	1.245E+4	0.13
4440.	0.13	1.248E+4	0.13
4470.	0.13	1.251E+4	0.13
4500.	0.13	1.254E+4	0.13
4530.	0.13	1.257E+4	0.13
4560.	0.13	1.26E+4	0.13
4590.	0.13	1.263E+4	0.13
4620.	0.13	1.266E+4	0.13
4650.	0.13	1.269E+4	0.13
4680.	0.13	1.272E+4	0.13
4710.	0.13	1.275E+4	0.13
4740.	0.13	1.278E+4	0.13
4770.	0.13	1.281E+4	0.13
4800.	0.13	1.284E+4	0.13
4830.	0.13	1.287E+4	0.13
4860.	0.13	1.29E+4	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
4890.	0.13	1.293E+4	0.13
4920.	0.13	1.296E+4	0.13
4950.	0.13	1.299E+4	0.13
4980.	0.13	1.302E+4	0.13
5010.	0.13	1.305E+4	0.13
5040.	0.13	1.308E+4	0.13
5070.	0.13	1.311E+4	0.13
5100.	0.13	1.314E+4	0.13
5130.	0.13	1.317E+4	0.13
5160.	0.13	1.32E+4	0.13
5190.	0.13	1.323E+4	0.13
5220.	0.13	1.326E+4	0.13
5250.	0.13	1.329E+4	0.13
5280.	0.13	1.332E+4	0.13
5310.	0.13	1.335E+4	0.13
5340.	0.13	1.338E+4	0.13
5370.	0.13	1.341E+4	0.13
5400.	0.13	1.344E+4	0.13
5430.	0.13	1.347E+4	0.13
5460.	0.13	1.35E+4	0.13
5490.	0.13	1.353E+4	0.13
5520.	0.13	1.356E+4	0.13
5550.	0.13	1.359E+4	0.13
5580.	0.13	1.362E+4	0.13
5610.	0.13	1.365E+4	0.13
5640.	0.13	1.368E+4	0.13
5670.	0.13	1.371E+4	0.13
5700.	0.13	1.374E+4	0.13
5730.	0.13	1.377E+4	0.13
5760.	0.13	1.38E+4	0.13
5790.	0.13	1.383E+4	0.13
5820.	0.13	1.386E+4	0.13
5850.	0.13	1.389E+4	0.13
5880.	0.13	1.392E+4	0.13
5910.	0.13	1.395E+4	0.13
5940.	0.13	1.398E+4	0.13
5970.	0.13	1.401E+4	0.13
6000.	0.13	1.404E+4	0.13
6030.	0.13	1.407E+4	0.13
6060.	0.13	1.41E+4	0.13
6090.	0.13	1.413E+4	0.13
6120.	0.13	1.416E+4	0.13
6150.	0.13	1.419E+4	0.13
6180.	0.13	1.422E+4	0.13
6210.	0.13	1.425E+4	0.13
6240.	0.13	1.428E+4	0.13
6270.	0.13	1.431E+4	0.13
6300.	0.13	1.434E+4	0.13
6330.	0.13	1.437E+4	0.13
6360.	0.13	1.44E+4	0.13
6390.	0.13	1.443E+4	0.13
6420.	0.13	1.446E+4	0.13
6450.	0.13	1.449E+4	0.13
6480.	0.13	1.452E+4	0.13
6510.	0.13	1.455E+4	0.13
6540.	0.13	1.458E+4	0.13
6570.	0.13	1.461E+4	0.13
6600.	0.13	1.464E+4	0.13
6630.	0.13	1.467E+4	0.13
6660.	0.13	1.47E+4	0.13
6690.	0.13	1.473E+4	0.13
6720.	0.13	1.476E+4	0.13
6750.	0.13	1.479E+4	0.13
6780.	0.13	1.482E+4	0.13
6810.	0.13	1.485E+4	0.13
6840.	0.13	1.488E+4	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
6870.	0.13	1.491E+4	0.13
6900.	0.13	1.494E+4	0.13
6930.	0.13	1.497E+4	0.13
6960.	0.13	1.5E+4	0.13
6990.	0.13	1.503E+4	0.13
7020.	0.13	1.506E+4	0.13
7050.	0.13	1.509E+4	0.13
7080.	0.13	1.512E+4	0.13
7110.	0.13	1.515E+4	0.13
7140.	0.13	1.518E+4	0.13
7170.	0.13	1.521E+4	0.13
7200.	0.13	1.524E+4	0.13
7230.	0.13	1.527E+4	0.13
7260.	0.13	1.53E+4	0.13
7290.	0.13	1.533E+4	0.13
7320.	0.13	1.536E+4	0.13
7350.	0.13	1.539E+4	0.13
7380.	0.13	1.542E+4	0.13
7410.	0.13	1.545E+4	0.13
7440.	0.13	1.548E+4	0.13
7470.	0.13	1.551E+4	0.13
7500.	0.13	1.554E+4	0.13
7530.	0.13	1.557E+4	0.13
7560.	0.13	1.56E+4	0.13
7590.	0.13	1.563E+4	0.13
7620.	0.13	1.566E+4	0.13
7650.	0.13	1.569E+4	0.13
7680.	0.13	1.572E+4	0.13
7710.	0.13	1.575E+4	0.13
7740.	0.13	1.578E+4	0.13
7770.	0.13	1.581E+4	0.13
7800.	0.13	1.584E+4	0.13
7830.	0.13	1.587E+4	0.13
7860.	0.13	1.59E+4	0.13
7890.	0.13	1.593E+4	0.13
7920.	0.13	1.596E+4	0.13
7950.	0.13	1.599E+4	0.13
7980.	0.13	1.602E+4	0.13
8010.	0.13		

OBSERVATION WELL DATA

No. of observation wells: 1

Observation Well No. 1: RW-13

X Location: 0. ft

Y Location: 0. ft

Radial distance from RW-13: 0. ft

Fully Penetrating Well

No. of Observations: 534

<u>Observation Data</u>			
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
30.	0.52	8040.	6.29
60.	4.36	8070.	6.35
90.	6.24	8100.	6.33
120.	6.35	8130.	6.39
150.	6.33	8160.	6.02
180.	6.35	8190.	6.33
210.	6.29	8220.	6.67
240.	6.35	8250.	6.35
270.	6.	8280.	6.37

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
300.	5.82	8310.	6.31
330.	5.94	8340.	6.33
360.	6.41	8370.	6.39
390.	6.41	8400.	6.29
420.	6.41	8430.	6.33
450.	6.39	8460.	6.26
480.	6.45	8490.	6.39
510.	6.41	8520.	6.39
540.	6.43	8550.	6.31
570.	5.84	8580.	6.35
600.	6.49	8610.	6.31
630.	6.49	8640.	6.33
660.	6.43	8670.	6.39
690.	6.33	8700.	6.41
720.	6.47	8730.	6.41
750.	6.41	8760.	6.31
780.	6.49	8790.	6.39
810.	6.47	8820.	6.29
840.	6.45	8850.	6.35
870.	6.41	8880.	6.39
900.	6.45	8910.	6.29
930.	6.18	8940.	6.02
960.	6.47	8970.	5.72
990.	6.43	9000.	6.41
1020.	6.49	9030.	6.33
1050.	6.49	9060.	6.31
1080.	6.47	9090.	6.39
1110.	6.43	9120.	6.35
1140.	6.41	9150.	6.31
1170.	6.49	9180.	6.39
1200.	6.45	9210.	6.41
1230.	6.49	9240.	6.29
1260.	6.49	9270.	6.41
1290.	6.43	9300.	6.35
1320.	6.41	9330.	6.35
1350.	6.31	9360.	6.39
1380.	6.31	9390.	6.31
1410.	6.37	9420.	6.33
1440.	6.31	9450.	6.41
1470.	6.2	9480.	6.37
1500.	6.37	9510.	6.41
1530.	6.26	9540.	6.31
1560.	6.35	9570.	6.37
1590.	6.31	9600.	6.31
1620.	6.37	9630.	6.35
1650.	6.33	9660.	6.31
1680.	6.14	9690.	6.35
1710.	6.35	9720.	6.39
1740.	6.37	9750.	6.35
1770.	6.37	9780.	6.35
1800.	6.31	9810.	6.39
1830.	6.39	9840.	6.31
1860.	6.33	9870.	6.39
1890.	6.39	9900.	6.31
1920.	6.33	9930.	6.31
1950.	6.37	9960.	6.41
1980.	6.37	9990.	6.24
2010.	6.35	1.002E+4	6.39
2040.	6.35	1.005E+4	6.31
2070.	6.29	1.008E+4	6.39
2100.	6.33	1.011E+4	6.37
2130.	6.2	1.014E+4	6.37
2160.	6.35	1.017E+4	6.37
2190.	6.35	1.02E+4	6.29
2220.	6.39	1.023E+4	6.29
2250.	6.39	1.026E+4	6.39

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
2280.	6.39	1.029E+4	6.31
2310.	6.31	1.032E+4	6.39
2340.	5.88	1.035E+4	6.37
2370.	6.39	1.038E+4	6.31
2400.	6.41	1.041E+4	6.41
2430.	6.29	1.044E+4	6.29
2460.	6.35	1.047E+4	6.31
2490.	6.39	1.05E+4	6.29
2520.	6.12	1.053E+4	6.29
2550.	6.39	1.056E+4	6.37
2580.	6.29	1.059E+4	6.33
2610.	6.37	1.062E+4	6.29
2640.	6.39	1.065E+4	6.37
2670.	6.06	1.068E+4	6.31
2700.	6.41	1.071E+4	6.71
2730.	6.29	1.074E+4	6.35
2760.	6.33	1.077E+4	6.37
2790.	6.33	1.08E+4	6.29
2820.	6.31	1.083E+4	6.35
2850.	6.31	1.086E+4	6.26
2880.	6.39	1.089E+4	6.37
2910.	6.02	1.092E+4	6.29
2940.	6.26	1.095E+4	6.31
2970.	6.39	1.098E+4	6.26
3000.	6.37	1.101E+4	6.26
3030.	6.41	1.104E+4	6.26
3060.	6.39	1.107E+4	6.37
3090.	6.29	1.11E+4	6.26
3120.	6.33	1.113E+4	6.37
3150.	6.39	1.116E+4	6.33
3180.	6.39	1.119E+4	6.37
3210.	6.29	1.122E+4	6.31
3240.	6.29	1.125E+4	6.26
3270.	6.31	1.128E+4	6.33
3300.	6.33	1.131E+4	6.35
3330.	6.39	1.134E+4	6.37
3360.	6.1	1.137E+4	6.29
3390.	6.29	1.14E+4	6.37
3420.	6.31	1.143E+4	6.31
3450.	6.41	1.146E+4	6.33
3480.	6.31	1.149E+4	6.33
3510.	6.41	1.152E+4	6.29
3540.	6.35	1.155E+4	6.37
3570.	6.41	1.158E+4	6.29
3600.	6.37	1.161E+4	6.37
3630.	6.35	1.164E+4	6.35
3660.	6.41	1.167E+4	6.16
3690.	6.29	1.17E+4	6.2
3720.	6.33	1.173E+4	6.14
3750.	6.35	1.176E+4	6.12
3780.	6.39	1.179E+4	6.37
3810.	6.33	1.182E+4	6.31
3840.	6.35	1.185E+4	6.33
3870.	6.29	1.188E+4	6.33
3900.	6.47	1.191E+4	6.39
3930.	6.2	1.194E+4	6.35
3960.	6.06	1.197E+4	6.33
3990.	6.37	1.2E+4	6.37
4020.	6.39	1.203E+4	6.31
4050.	6.37	1.206E+4	6.29
4080.	6.37	1.209E+4	6.39
4110.	6.37	1.212E+4	6.33
4140.	6.33	1.215E+4	6.39
4170.	6.37	1.218E+4	6.26
4200.	6.37	1.221E+4	6.33
4230.	6.22	1.224E+4	6.29

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
4260.	5.46	1.227E+4	6.35
4290.	6.24	1.23E+4	6.37
4320.	6.39	1.233E+4	6.37
4350.	6.31	1.236E+4	6.29
4380.	6.31	1.239E+4	6.33
4410.	6.35	1.242E+4	6.31
4440.	6.31	1.245E+4	6.22
4470.	6.35	1.248E+4	6.08
4500.	6.39	1.251E+4	6.1
4530.	6.35	1.254E+4	6.33
4560.	6.39	1.257E+4	6.33
4590.	6.33	1.26E+4	6.29
4620.	6.37	1.263E+4	6.37
4650.	6.41	1.266E+4	6.35
4680.	6.39	1.269E+4	6.26
4710.	6.31	1.272E+4	6.29
4740.	6.31	1.275E+4	6.37
4770.	6.33	1.278E+4	6.37
4800.	6.37	1.281E+4	6.37
4830.	6.33	1.284E+4	6.31
4860.	6.31	1.287E+4	6.35
4890.	6.33	1.29E+4	6.39
4920.	6.37	1.293E+4	6.26
4950.	6.33	1.296E+4	6.31
4980.	6.35	1.299E+4	6.14
5010.	6.41	1.302E+4	6.31
5040.	6.37	1.305E+4	6.35
5070.	6.35	1.308E+4	6.39
5100.	6.39	1.311E+4	6.29
5130.	6.41	1.314E+4	6.35
5160.	6.29	1.317E+4	6.37
5190.	6.35	1.32E+4	6.31
5220.	6.31	1.323E+4	6.37
5250.	6.33	1.326E+4	6.33
5280.	6.35	1.329E+4	6.37
5310.	6.31	1.332E+4	6.35
5340.	6.37	1.335E+4	6.37
5370.	6.33	1.338E+4	6.37
5400.	6.39	1.341E+4	6.35
5430.	6.33	1.344E+4	6.31
5460.	6.37	1.347E+4	6.29
5490.	6.33	1.35E+4	6.39
5520.	6.33	1.353E+4	6.37
5550.	6.39	1.356E+4	6.35
5580.	6.35	1.359E+4	6.31
5610.	6.39	1.362E+4	6.37
5640.	6.35	1.365E+4	6.31
5670.	6.33	1.368E+4	6.41
5700.	6.39	1.371E+4	6.39
5730.	6.39	1.374E+4	6.37
5760.	6.31	1.377E+4	6.
5790.	6.31	1.38E+4	6.41
5820.	6.35	1.383E+4	6.39
5850.	6.39	1.386E+4	6.39
5880.	6.33	1.389E+4	6.33
5910.	6.31	1.392E+4	6.35
5940.	6.29	1.395E+4	6.35
5970.	6.31	1.398E+4	6.39
6000.	6.39	1.401E+4	6.41
6030.	6.37	1.404E+4	6.31
6060.	6.37	1.407E+4	6.39
6090.	6.35	1.41E+4	6.31
6120.	6.41	1.413E+4	6.33
6150.	6.37	1.416E+4	6.29
6180.	6.31	1.419E+4	6.33
6210.	6.35	1.422E+4	6.31

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
6240.	6.31	1.425E+4	6.37
6270.	6.31	1.428E+4	5.78
6300.	6.31	1.431E+4	6.31
6330.	6.29	1.434E+4	6.41
6360.	6.39	1.437E+4	6.31
6390.	6.31	1.44E+4	6.33
6420.	6.29	1.443E+4	6.41
6450.	6.39	1.446E+4	6.41
6480.	6.55	1.449E+4	6.33
6510.	6.45	1.452E+4	6.35
6540.	6.2	1.455E+4	6.39
6570.	6.33	1.458E+4	6.61
6600.	6.33	1.461E+4	6.35
6630.	6.33	1.464E+4	6.37
6660.	6.29	1.467E+4	6.31
6690.	6.31	1.47E+4	6.39
6720.	6.37	1.473E+4	6.37
6750.	6.35	1.476E+4	6.31
6780.	6.35	1.479E+4	6.33
6810.	6.33	1.482E+4	6.35
6840.	6.31	1.485E+4	6.33
6870.	6.39	1.488E+4	6.35
6900.	6.33	1.491E+4	6.37
6930.	6.39	1.494E+4	6.31
6960.	7.95	1.497E+4	6.31
6990.	6.22	1.5E+4	6.33
7020.	6.29	1.503E+4	6.31
7050.	6.31	1.506E+4	6.39
7080.	6.31	1.509E+4	6.33
7110.	6.39	1.512E+4	6.41
7140.	6.31	1.515E+4	6.37
7170.	6.31	1.518E+4	6.29
7200.	6.41	1.521E+4	6.39
7230.	6.35	1.524E+4	6.35
7260.	6.35	1.527E+4	6.37
7290.	6.41	1.53E+4	6.31
7320.	6.41	1.533E+4	6.31
7350.	6.39	1.536E+4	6.39
7380.	6.35	1.539E+4	6.33
7410.	6.14	1.542E+4	6.33
7440.	6.67	1.545E+4	6.33
7470.	6.26	1.548E+4	6.35
7500.	6.41	1.551E+4	6.41
7530.	6.39	1.554E+4	6.41
7560.	6.39	1.557E+4	6.26
7590.	6.41	1.56E+4	6.33
7620.	6.39	1.563E+4	6.39
7650.	6.41	1.566E+4	6.41
7680.	6.31	1.569E+4	6.39
7710.	6.41	1.572E+4	6.41
7740.	6.39	1.575E+4	6.31
7770.	6.31	1.578E+4	6.39
7800.	6.39	1.581E+4	6.39
7830.	6.31	1.584E+4	5.8
7860.	6.31	1.587E+4	6.33
7890.	6.31	1.59E+4	6.39
7920.	6.39	1.593E+4	6.39
7950.	6.31	1.596E+4	6.33
7980.	6.33	1.599E+4	6.35
8010.	6.39	1.602E+4	6.41

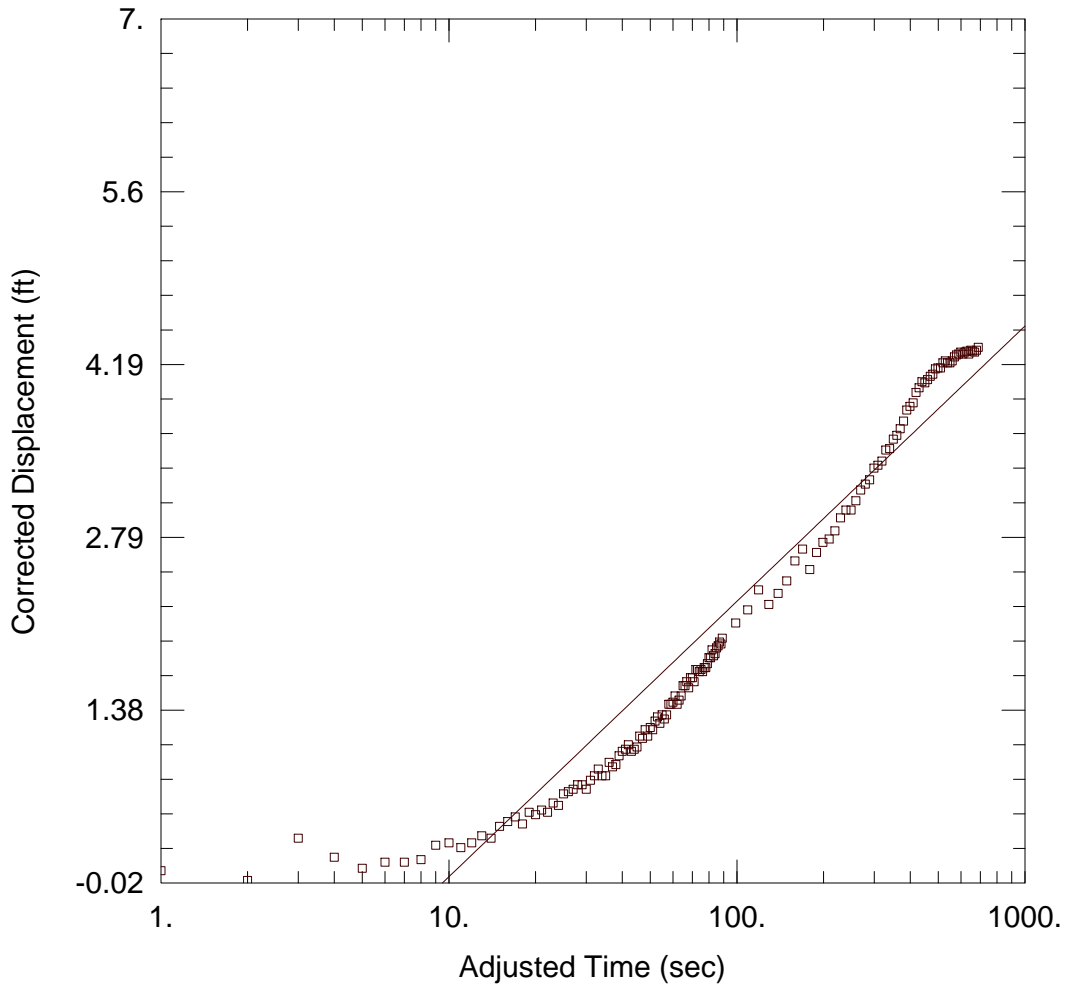
SOLUTION

Pumping Test
Aquifer Model: Unconfined
Solution Method: Theis

VISUAL ESTIMATION RESULTSEstimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
T	0.01166	ft ² /sec
S	0.7083	
Kz/Kr	1.	
b	10.1	ft

$K = T/b = 0.001154$ ft/sec (0.03518 cm/sec)
 $S_s = S/b = 0.07013$ 1/ft



WELL TEST ANALYSIS

Data Set: C:\...\Constant Rate Pumping Test RW-13 CooperJacob Final.aqt
 Date: 01/28/12 Time: 23:22:41

PROJECT INFORMATION

Company: AEC
 Client: Royal Farms
 Project: 05-056
 Location: North East, MD
 Test Well: RW-13
 Test Date: 1/13/12

AQUIFER DATA

Saturated Thickness: 10.1 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
RW-13	0	0	□ RW-13	0	0

SOLUTION

Aquifer Model: Unconfined Solution Method: Cooper-Jacob
 T = 0.01065 ft²/sec S = 0.857

Data Set: C:\Users\Jeff\Desktop\Work Folder\Store 096 - 500 Mechanics Valley Road, North East\Pilot Study - Jan
Date: 01/28/12
Time: 23:23:19

PROJECT INFORMATION

Company: AEC
Client: Royal Farms
Project: 05-056
Location: North East, MD
Test Date: 1/13/12
Test Well: RW-13

AQUIFER DATA

Saturated Thickness: 10.1 ft
Anisotropy Ratio (Kz/Kr): 1.

PUMPING WELL DATA

No. of pumping wells: 1

Pumping Well No. 1: RW-13

X Location: 0. ft
Y Location: 0. ft

Casing Radius: 0.33 ft
Well Radius: 0.52 ft

Fully Penetrating Well

No. of pumping periods: 535

Pumping Period Data			
<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
0.	0.13	8040.	0.13
30.	0.13	8070.	0.13
60.	0.13	8100.	0.13
90.	0.13	8130.	0.13
120.	0.13	8160.	0.13
150.	0.13	8190.	0.13
180.	0.13	8220.	0.13
210.	0.13	8250.	0.13
240.	0.13	8280.	0.13
270.	0.13	8310.	0.13
300.	0.13	8340.	0.13
330.	0.13	8370.	0.13
360.	0.13	8400.	0.13
390.	0.13	8430.	0.13
420.	0.13	8460.	0.13
450.	0.13	8490.	0.13
480.	0.13	8520.	0.13
510.	0.13	8550.	0.13
540.	0.13	8580.	0.13
570.	0.13	8610.	0.13
600.	0.13	8640.	0.13
630.	0.13	8670.	0.13
660.	0.13	8700.	0.13
690.	0.13	8730.	0.13
720.	0.13	8760.	0.13
750.	0.13	8790.	0.13
780.	0.13	8820.	0.13
810.	0.13	8850.	0.13
840.	0.13	8880.	0.13
870.	0.13	8910.	0.13
900.	0.13	8940.	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
930.	0.13	8970.	0.13
960.	0.13	9000.	0.13
990.	0.13	9030.	0.13
1020.	0.13	9060.	0.13
1050.	0.13	9090.	0.13
1080.	0.13	9120.	0.13
1110.	0.13	9150.	0.13
1140.	0.13	9180.	0.13
1170.	0.13	9210.	0.13
1200.	0.13	9240.	0.13
1230.	0.13	9270.	0.13
1260.	0.13	9300.	0.13
1290.	0.13	9330.	0.13
1320.	0.13	9360.	0.13
1350.	0.13	9390.	0.13
1380.	0.13	9420.	0.13
1410.	0.13	9450.	0.13
1440.	0.13	9480.	0.13
1470.	0.13	9510.	0.13
1500.	0.13	9540.	0.13
1530.	0.13	9570.	0.13
1560.	0.13	9600.	0.13
1590.	0.13	9630.	0.13
1620.	0.13	9660.	0.13
1650.	0.13	9690.	0.13
1680.	0.13	9720.	0.13
1710.	0.13	9750.	0.13
1740.	0.13	9780.	0.13
1770.	0.13	9810.	0.13
1800.	0.13	9840.	0.13
1830.	0.13	9870.	0.13
1860.	0.13	9900.	0.13
1890.	0.13	9930.	0.13
1920.	0.13	9960.	0.13
1950.	0.13	9990.	0.13
1980.	0.13	1.002E+4	0.13
2010.	0.13	1.005E+4	0.13
2040.	0.13	1.008E+4	0.13
2070.	0.13	1.011E+4	0.13
2100.	0.13	1.014E+4	0.13
2130.	0.13	1.017E+4	0.13
2160.	0.13	1.02E+4	0.13
2190.	0.13	1.023E+4	0.13
2220.	0.13	1.026E+4	0.13
2250.	0.13	1.029E+4	0.13
2280.	0.13	1.032E+4	0.13
2310.	0.13	1.035E+4	0.13
2340.	0.13	1.038E+4	0.13
2370.	0.13	1.041E+4	0.13
2400.	0.13	1.044E+4	0.13
2430.	0.13	1.047E+4	0.13
2460.	0.13	1.05E+4	0.13
2490.	0.13	1.053E+4	0.13
2520.	0.13	1.056E+4	0.13
2550.	0.13	1.059E+4	0.13
2580.	0.13	1.062E+4	0.13
2610.	0.13	1.065E+4	0.13
2640.	0.13	1.068E+4	0.13
2670.	0.13	1.071E+4	0.13
2700.	0.13	1.074E+4	0.13
2730.	0.13	1.077E+4	0.13
2760.	0.13	1.08E+4	0.13
2790.	0.13	1.083E+4	0.13
2820.	0.13	1.086E+4	0.13
2850.	0.13	1.089E+4	0.13
2880.	0.13	1.092E+4	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
2910.	0.13	1.095E+4	0.13
2940.	0.13	1.098E+4	0.13
2970.	0.13	1.101E+4	0.13
3000.	0.13	1.104E+4	0.13
3030.	0.13	1.107E+4	0.13
3060.	0.13	1.11E+4	0.13
3090.	0.13	1.113E+4	0.13
3120.	0.13	1.116E+4	0.13
3150.	0.13	1.119E+4	0.13
3180.	0.13	1.122E+4	0.13
3210.	0.13	1.125E+4	0.13
3240.	0.13	1.128E+4	0.13
3270.	0.13	1.131E+4	0.13
3300.	0.13	1.134E+4	0.13
3330.	0.13	1.137E+4	0.13
3360.	0.13	1.14E+4	0.13
3390.	0.13	1.143E+4	0.13
3420.	0.13	1.146E+4	0.13
3450.	0.13	1.149E+4	0.13
3480.	0.13	1.152E+4	0.13
3510.	0.13	1.155E+4	0.13
3540.	0.13	1.158E+4	0.13
3570.	0.13	1.161E+4	0.13
3600.	0.13	1.164E+4	0.13
3630.	0.13	1.167E+4	0.13
3660.	0.13	1.17E+4	0.13
3690.	0.13	1.173E+4	0.13
3720.	0.13	1.176E+4	0.13
3750.	0.13	1.179E+4	0.13
3780.	0.13	1.182E+4	0.13
3810.	0.13	1.185E+4	0.13
3840.	0.13	1.188E+4	0.13
3870.	0.13	1.191E+4	0.13
3900.	0.13	1.194E+4	0.13
3930.	0.13	1.197E+4	0.13
3960.	0.13	1.2E+4	0.13
3990.	0.13	1.203E+4	0.13
4020.	0.13	1.206E+4	0.13
4050.	0.13	1.209E+4	0.13
4080.	0.13	1.212E+4	0.13
4110.	0.13	1.215E+4	0.13
4140.	0.13	1.218E+4	0.13
4170.	0.13	1.221E+4	0.13
4200.	0.13	1.224E+4	0.13
4230.	0.13	1.227E+4	0.13
4260.	0.13	1.23E+4	0.13
4290.	0.13	1.233E+4	0.13
4320.	0.13	1.236E+4	0.13
4350.	0.13	1.239E+4	0.13
4380.	0.13	1.242E+4	0.13
4410.	0.13	1.245E+4	0.13
4440.	0.13	1.248E+4	0.13
4470.	0.13	1.251E+4	0.13
4500.	0.13	1.254E+4	0.13
4530.	0.13	1.257E+4	0.13
4560.	0.13	1.26E+4	0.13
4590.	0.13	1.263E+4	0.13
4620.	0.13	1.266E+4	0.13
4650.	0.13	1.269E+4	0.13
4680.	0.13	1.272E+4	0.13
4710.	0.13	1.275E+4	0.13
4740.	0.13	1.278E+4	0.13
4770.	0.13	1.281E+4	0.13
4800.	0.13	1.284E+4	0.13
4830.	0.13	1.287E+4	0.13
4860.	0.13	1.29E+4	0.13

<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>	<u>Time (sec)</u>	<u>Rate (cu. ft/sec)</u>
4890.	0.13	1.293E+4	0.13
4920.	0.13	1.296E+4	0.13
4950.	0.13	1.299E+4	0.13
4980.	0.13	1.302E+4	0.13
5010.	0.13	1.305E+4	0.13
5040.	0.13	1.308E+4	0.13
5070.	0.13	1.311E+4	0.13
5100.	0.13	1.314E+4	0.13
5130.	0.13	1.317E+4	0.13
5160.	0.13	1.32E+4	0.13
5190.	0.13	1.323E+4	0.13
5220.	0.13	1.326E+4	0.13
5250.	0.13	1.329E+4	0.13
5280.	0.13	1.332E+4	0.13
5310.	0.13	1.335E+4	0.13
5340.	0.13	1.338E+4	0.13
5370.	0.13	1.341E+4	0.13
5400.	0.13	1.344E+4	0.13
5430.	0.13	1.347E+4	0.13
5460.	0.13	1.35E+4	0.13
5490.	0.13	1.353E+4	0.13
5520.	0.13	1.356E+4	0.13
5550.	0.13	1.359E+4	0.13
5580.	0.13	1.362E+4	0.13
5610.	0.13	1.365E+4	0.13
5640.	0.13	1.368E+4	0.13
5670.	0.13	1.371E+4	0.13
5700.	0.13	1.374E+4	0.13
5730.	0.13	1.377E+4	0.13
5760.	0.13	1.38E+4	0.13
5790.	0.13	1.383E+4	0.13
5820.	0.13	1.386E+4	0.13
5850.	0.13	1.389E+4	0.13
5880.	0.13	1.392E+4	0.13
5910.	0.13	1.395E+4	0.13
5940.	0.13	1.398E+4	0.13
5970.	0.13	1.401E+4	0.13
6000.	0.13	1.404E+4	0.13
6030.	0.13	1.407E+4	0.13
6060.	0.13	1.41E+4	0.13
6090.	0.13	1.413E+4	0.13
6120.	0.13	1.416E+4	0.13
6150.	0.13	1.419E+4	0.13
6180.	0.13	1.422E+4	0.13
6210.	0.13	1.425E+4	0.13
6240.	0.13	1.428E+4	0.13
6270.	0.13	1.431E+4	0.13
6300.	0.13	1.434E+4	0.13
6330.	0.13	1.437E+4	0.13
6360.	0.13	1.44E+4	0.13
6390.	0.13	1.443E+4	0.13
6420.	0.13	1.446E+4	0.13
6450.	0.13	1.449E+4	0.13
6480.	0.13	1.452E+4	0.13
6510.	0.13	1.455E+4	0.13
6540.	0.13	1.458E+4	0.13
6570.	0.13	1.461E+4	0.13
6600.	0.13	1.464E+4	0.13
6630.	0.13	1.467E+4	0.13
6660.	0.13	1.47E+4	0.13
6690.	0.13	1.473E+4	0.13
6720.	0.13	1.476E+4	0.13
6750.	0.13	1.479E+4	0.13
6780.	0.13	1.482E+4	0.13
6810.	0.13	1.485E+4	0.13
6840.	0.13	1.488E+4	0.13

Time (sec)	Rate (cu. ft/sec)	Time (sec)	Rate (cu. ft/sec)
6870.	0.13	1.491E+4	0.13
6900.	0.13	1.494E+4	0.13
6930.	0.13	1.497E+4	0.13
6960.	0.13	1.5E+4	0.13
6990.	0.13	1.503E+4	0.13
7020.	0.13	1.506E+4	0.13
7050.	0.13	1.509E+4	0.13
7080.	0.13	1.512E+4	0.13
7110.	0.13	1.515E+4	0.13
7140.	0.13	1.518E+4	0.13
7170.	0.13	1.521E+4	0.13
7200.	0.13	1.524E+4	0.13
7230.	0.13	1.527E+4	0.13
7260.	0.13	1.53E+4	0.13
7290.	0.13	1.533E+4	0.13
7320.	0.13	1.536E+4	0.13
7350.	0.13	1.539E+4	0.13
7380.	0.13	1.542E+4	0.13
7410.	0.13	1.545E+4	0.13
7440.	0.13	1.548E+4	0.13
7470.	0.13	1.551E+4	0.13
7500.	0.13	1.554E+4	0.13
7530.	0.13	1.557E+4	0.13
7560.	0.13	1.56E+4	0.13
7590.	0.13	1.563E+4	0.13
7620.	0.13	1.566E+4	0.13
7650.	0.13	1.569E+4	0.13
7680.	0.13	1.572E+4	0.13
7710.	0.13	1.575E+4	0.13
7740.	0.13	1.578E+4	0.13
7770.	0.13	1.581E+4	0.13
7800.	0.13	1.584E+4	0.13
7830.	0.13	1.587E+4	0.13
7860.	0.13	1.59E+4	0.13
7890.	0.13	1.593E+4	0.13
7920.	0.13	1.596E+4	0.13
7950.	0.13	1.599E+4	0.13
7980.	0.13	1.602E+4	0.13
8010.	0.13		

OBSERVATION WELL DATA

No. of observation wells: 1

Observation Well No. 1: RW-13

X Location: 0. ft

Y Location: 0. ft

Radial distance from RW-13: 0. ft

Fully Penetrating Well

No. of Observations: 149

Observation Data			
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
1.	0.08	76.	1.87
2.	-0.02	77.	1.91
3.	0.35	78.	1.91
4.	0.19	79.	1.95
5.	0.1	80.	2.01
6.	0.15	81.	2.01
7.	0.15	82.	2.09
8.	0.17	83.	2.03
9.	0.29	84.	2.05

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
10.	0.31	85.	2.11
11.	0.27	86.	2.13
12.	0.31	87.	2.17
13.	0.37	88.	2.15
14.	0.35	89.	2.21
15.	0.45	99.	2.37
16.	0.49	109.	2.51
17.	0.53	119.	2.73
18.	0.47	129.	2.57
19.	0.57	139.	2.69
20.	0.55	149.	2.83
21.	0.59	159.	3.06
22.	0.57	169.	3.2
23.	0.65	179.	2.96
24.	0.63	189.	3.16
25.	0.73	199.	3.28
26.	0.75	209.	3.32
27.	0.77	219.	3.42
28.	0.81	229.	3.58
29.	0.81	239.	3.68
30.	0.77	249.	3.68
31.	0.85	259.	3.8
32.	0.89	269.	3.94
33.	0.95	279.	4.02
34.	0.89	289.	4.08
35.	0.89	299.	4.24
36.	1.01	309.	4.28
37.	0.97	319.	4.34
38.	0.99	329.	4.5
39.	1.07	339.	4.52
40.	1.11	349.	4.66
41.	1.13	359.	4.72
42.	1.17	369.	4.82
43.	1.11	379.	4.94
44.	1.13	389.	5.12
45.	1.15	399.	5.18
46.	1.25	409.	5.24
47.	1.23	419.	5.42
48.	1.31	429.	5.5
49.	1.25	439.	5.61
50.	1.33	449.	5.59
51.	1.31	459.	5.65
52.	1.39	469.	5.71
53.	1.43	479.	5.75
54.	1.37	489.	5.85
55.	1.45	499.	5.87
56.	1.41	509.	5.87
57.	1.45	519.	5.97
58.	1.55	529.	6.01
59.	1.55	539.	5.97
60.	1.57	549.	5.97
61.	1.63	559.	6.01
62.	1.55	569.	6.09
63.	1.59	579.	6.13
64.	1.63	589.	6.15
65.	1.73	599.	6.19
66.	1.73	609.	6.15
67.	1.77	619.	6.19
68.	1.71	629.	6.21
69.	1.81	639.	6.15
70.	1.81	649.	6.23
71.	1.77	659.	6.21
72.	1.89	669.	6.19
73.	1.89	679.	6.23
74.	1.87	689.	6.29
75.	1.89		

SOLUTION

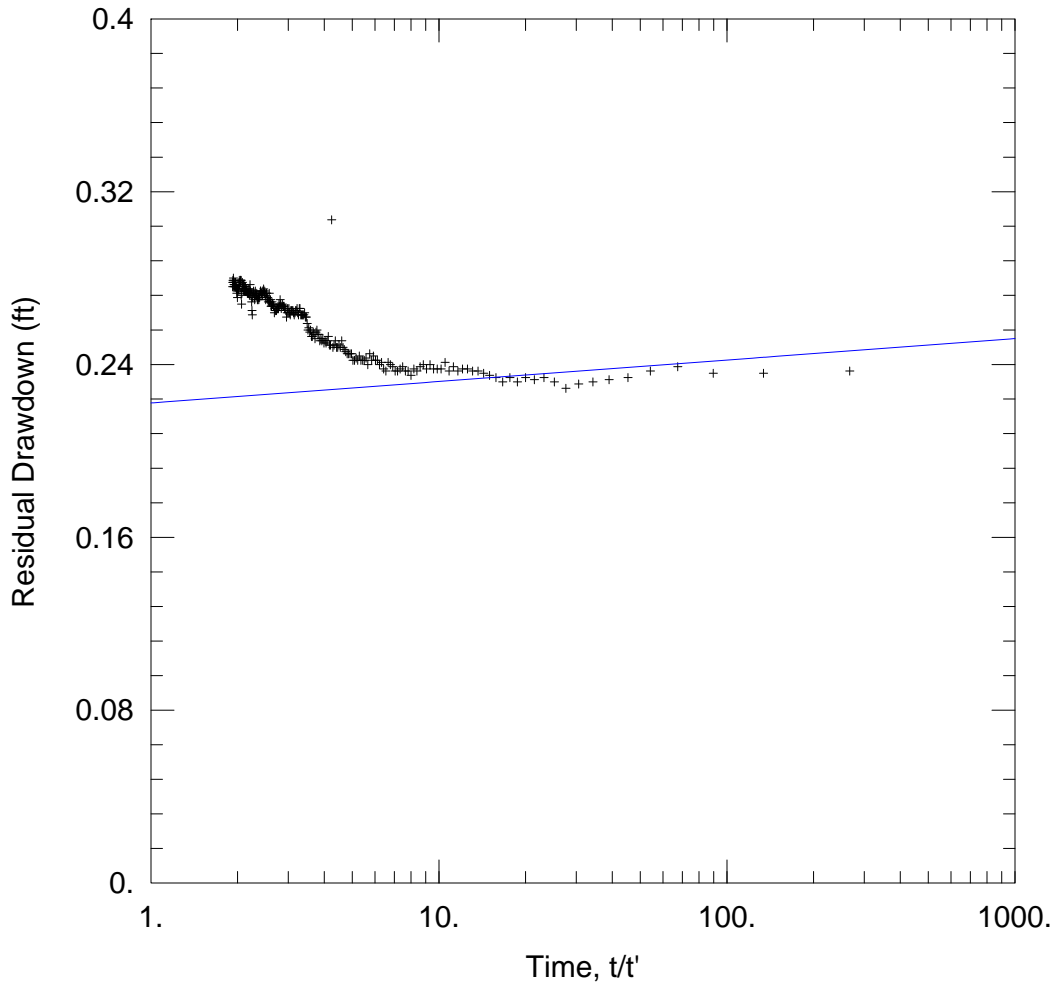
Pumping Test
Aquifer Model: Unconfined
Solution Method: Cooper-Jacob

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
T	0.01065	ft ² /sec
S	0.857	

$K = T/b = 0.001054$ ft/sec (0.03214 cm/sec)
 $S_s = S/b = 0.08485$ 1/ft



RECOVERY-CONSTANT RATE

Data Set: C:\...\RW4 Theis Recovery Final.aqt

Date: 01/28/12

Time: 23:25:24

PROJECT INFORMATION

Company: AEC

Client: RF

Project: 05-056RF96

Location: NE MD

Test Well: RW-13

Test Date: 1-13-12

AQUIFER DATA

Saturated Thickness: 10.1 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Observation Wells

Well Name	X (ft)	Y (ft)
RW-13	0	0

Well Name	X (ft)	Y (ft)
+ RW-4	21	0

SOLUTION

Aquifer Model: Confined

Solution Method: Theis (Recovery)

T = 2.397 ft²/min

S/S' = 4.428E-23

Data Set: C:\Users\Jeff\Desktop\Work Folder\Store 096 - 500 Mechanics Valley Road, North East\Pilot Study - Jan
 Title: Recovery-Constant Rate
 Date: 01/28/12
 Time: 23:25:45

PROJECT INFORMATION

Company: AEC
 Client: RF
 Project: 05-056RF96
 Location: NE MD
 Test Date: 1-13-12
 Test Well: RW-13

AQUIFER DATA

Saturated Thickness: 10.1 ft
 Anisotropy Ratio (Kz/Kr): 1.

PUMPING WELL DATA

No. of pumping wells: 1

Pumping Well No. 1: RW-13

X Location: 0. ft
 Y Location: 0. ft

Casing Radius: 0.33 ft
 Well Radius: 0.52 ft

Fully Penetrating Well

No. of pumping periods: 2

Pumping Period Data			
Time (min)	Rate (cu. ft/min)	Time (min)	Rate (cu. ft/min)
0.	0.13	133.	0.

OBSERVATION WELL DATA

No. of observation wells: 1

Observation Well No. 1: RW-4

X Location: 21. ft
 Y Location: 0. ft

Radial distance from RW-13: 21. ft

Fully Penetrating Well

No. of Observations: 555

Observation Data			
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.5	0.117	139.5	0.233
1.	0.135	140.	0.234
1.5	0.143	140.5	0.232
2.	0.149	141.	0.234
2.5	0.153	141.5	0.232
3.	0.156	142.	0.234
3.5	0.155	142.5	0.235
4.	0.156	143.	0.236
4.5	0.159	143.5	0.237
5.	0.16	144.	0.237
5.5	0.16	144.5	0.238

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
6.	0.162	145.	0.238
6.5	0.158	145.5	0.237
7.	0.163	146.	0.239
7.5	0.164	146.5	0.237
8.	0.167	147.	0.241
8.5	0.169	147.5	0.238
9.	0.168	148.	0.238
9.5	0.169	148.5	0.238
10.	0.169	149.	0.24
10.5	0.17	149.5	0.238
11.	0.17	150.	0.24
11.5	0.172	150.5	0.239
12.	0.172	151.	0.237
12.5	0.174	151.5	0.238
13.	0.172	152.	0.235
13.5	0.176	152.5	0.237
14.	0.176	153.	0.237
14.5	0.174	153.5	0.239
15.	0.178	154.	0.238
15.5	0.176	154.5	0.237
16.	0.177	155.	0.237
16.5	0.175	155.5	0.239
17.	0.176	156.	0.24
17.5	0.174	156.5	0.241
18.	0.179	157.	0.237
18.5	0.178	157.5	0.238
19.	0.178	158.	0.241
19.5	0.178	158.5	0.24
20.	0.177	159.	0.242
20.5	0.18	159.5	0.242
21.	0.178	160.	0.244
21.5	0.18	160.5	0.242
22.	0.183	161.	0.245
22.5	0.183	161.5	0.24
23.	0.181	162.	0.243
23.5	0.184	162.5	0.242
24.	0.184	163.	0.242
24.5	0.186	163.5	0.242
25.	0.185	164.	0.244
25.5	0.187	164.5	0.242
26.	0.185	165.	0.243
26.5	0.187	165.5	0.242
27.	0.186	166.	0.242
27.5	0.19	166.5	0.245
28.	0.187	167.	0.245
28.5	0.188	167.5	0.245
29.	0.19	168.	0.245
29.5	0.191	168.5	0.246
30.	0.19	169.	0.247
30.5	0.189	169.5	0.248
31.	0.191	170.	0.251
31.5	0.189	170.5	0.248
32.	0.19	171.	0.249
32.5	0.193	171.5	0.248
33.	0.192	172.	0.248
33.5	0.193	172.5	0.251
34.	0.195	173.	0.249
34.5	0.195	173.5	0.248
35.	0.198	174.	0.307
35.5	0.194	174.5	0.249
36.	0.195	175.	0.249
36.5	0.193	175.5	0.253
37.	0.193	176.	0.251
37.5	0.194	176.5	0.25
38.	0.193	177.	0.251
38.5	0.191	177.5	0.25

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
39.	0.195	178.	0.252
39.5	0.193	178.5	0.251
40.	0.19	179.	0.252
40.5	0.193	179.5	0.251
41.	0.193	180.	0.254
41.5	0.195	180.5	0.254
42.	0.195	181.	0.256
42.5	0.193	181.5	0.255
43.	0.194	182.	0.252
43.5	0.192	182.5	0.254
44.	0.197	183.	0.255
44.5	0.196	183.5	0.253
45.	0.194	184.	0.253
45.5	0.19	184.5	0.256
46.	0.19	185.	0.255
46.5	0.19	185.5	0.257
47.	0.191	186.	0.256
47.5	0.192	186.5	0.259
48.	0.192	187.	0.262
48.5	0.194	187.5	0.262
49.	0.196	188.	0.264
49.5	0.195	188.5	0.263
50.	0.197	189.	0.263
50.5	0.196	189.5	0.263
51.	0.193	190.	0.263
51.5	0.196	190.5	0.263
52.	0.202	191.	0.266
52.5	0.202	191.5	0.266
53.	0.202	192.	0.263
53.5	0.201	192.5	0.264
54.	0.201	193.	0.266
54.5	0.2	193.5	0.265
55.	0.201	194.	0.265
55.5	0.202	194.5	0.264
56.	0.2	195.	0.263
56.5	0.2	195.5	0.264
57.	0.202	196.	0.265
57.5	0.202	196.5	0.265
58.	0.205	197.	0.265
58.5	0.201	197.5	0.265
59.	0.197	198.	0.263
59.5	0.198	198.5	0.264
60.	0.202	199.	0.266
60.5	0.201	199.5	0.264
61.	0.2	200.	0.266
61.5	0.2	200.5	0.264
62.	0.205	201.	0.262
62.5	0.206	201.5	0.265
63.	0.203	202.	0.266
63.5	0.206	202.5	0.266
64.	0.204	203.	0.267
64.5	0.204	203.5	0.267
65.	0.206	204.	0.267
65.5	0.203	204.5	0.268
66.	0.204	205.	0.267
66.5	0.206	205.5	0.266
67.	0.206	206.	0.268
67.5	0.206	206.5	0.27
68.	0.205	207.	0.267
68.5	0.201	207.5	0.268
69.	0.202	208.	0.266
69.5	0.205	208.5	0.267
70.	0.203	209.	0.266
70.5	0.205	209.5	0.266
71.	0.204	210.	0.265
71.5	0.206	210.5	0.265

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
72.	0.205	211.	0.265
72.5	0.204	211.5	0.266
73.	0.205	212.	0.264
73.5	0.203	212.5	0.267
74.	0.204	213.	0.267
74.5	0.205	213.5	0.268
75.	0.202	214.	0.268
75.5	0.202	214.5	0.269
76.	0.203	215.	0.267
76.5	0.205	215.5	0.267
77.	0.206	216.	0.27
77.5	0.205	216.5	0.269
78.	0.206	217.	0.269
78.5	0.208	217.5	0.273
79.	0.203	218.	0.27
79.5	0.207	218.5	0.269
80.	0.208	219.	0.27
80.5	0.208	219.5	0.271
81.	0.209	220.	0.271
81.5	0.208	220.5	0.273
82.	0.207	221.	0.273
82.5	0.207	221.5	0.27
83.	0.205	222.	0.272
83.5	0.207	222.5	0.274
84.	0.21	223.	0.273
84.5	0.209	223.5	0.273
85.	0.21	224.	0.275
85.5	0.21	224.5	0.274
86.	0.208	225.	0.274
86.5	0.207	225.5	0.272
87.	0.208	226.	0.272
87.5	0.209	226.5	0.273
88.	0.208	227.	0.273
88.5	0.208	227.5	0.274
89.	0.207	228.	0.274
89.5	0.209	228.5	0.272
90.	0.209	229.	0.271
90.5	0.211	229.5	0.272
91.	0.21	230.	0.27
91.5	0.209	230.5	0.271
92.	0.207	231.	0.272
92.5	0.211	231.5	0.27
93.	0.209	232.	0.27
93.5	0.211	232.5	0.271
94.	0.211	233.	0.273
94.5	0.21	233.5	0.272
95.	0.211	234.	0.272
95.5	0.214	234.5	0.272
96.	0.213	235.	0.274
96.5	0.216	235.5	0.273
97.	0.217	236.	0.27
97.5	0.217	236.5	0.271
98.	0.218	237.	0.273
98.5	0.216	237.5	0.274
99.	0.218	238.	0.273
99.5	0.217	238.5	0.273
100.	0.218	239.	0.271
100.5	0.217	239.5	0.263
101.	0.218	240.	0.265
101.5	0.216	240.5	0.269
102.	0.22	241.	0.273
102.5	0.22	241.5	0.272
103.	0.217	242.	0.273
103.5	0.215	242.5	0.274
104.	0.218	243.	0.277
104.5	0.219	243.5	0.275

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
105.	0.218	244.	0.272
105.5	0.219	244.5	0.273
106.	0.219	245.	0.273
106.5	0.216	245.5	0.273
107.	0.218	246.	0.275
107.5	0.219	246.5	0.273
108.	0.22	247.	0.273
108.5	0.22	247.5	0.273
109.	0.22	248.	0.274
109.5	0.22	248.5	0.275
110.	0.22	249.	0.274
110.5	0.218	249.5	0.274
111.	0.218	250.	0.274
111.5	0.219	250.5	0.276
112.	0.219	251.	0.274
112.5	0.22	251.5	0.274
113.	0.22	252.	0.274
113.5	0.222	252.5	0.276
114.	0.222	253.	0.274
114.5	0.222	253.5	0.277
115.	0.221	254.	0.274
115.5	0.22	254.5	0.277
116.	0.221	255.	0.277
116.5	0.222	255.5	0.276
117.	0.222	256.	0.277
117.5	0.225	256.5	0.278
118.	0.222	257.	0.276
118.5	0.222	257.5	0.273
119.	0.222	258.	0.268
119.5	0.222	258.5	0.272
120.	0.222	259.	0.279
120.5	0.227	259.5	0.279
121.	0.224	260.	0.279
121.5	0.225	260.5	0.278
122.	0.23	261.	0.278
122.5	0.23	261.5	0.278
123.	0.23	262.	0.277
123.5	0.232	262.5	0.279
124.	0.233	263.	0.278
124.5	0.234	263.5	0.274
125.	0.231	264.	0.275
125.5	0.23	264.5	0.275
126.	0.231	265.	0.277
126.5	0.233	265.5	0.275
127.	0.234	266.	0.275
127.5	0.231	266.5	0.271
128.	0.231	267.	0.274
128.5	0.229	267.5	0.275
129.	0.23	268.	0.273
129.5	0.232	268.5	0.275
130.	0.232	269.	0.276
130.5	0.231	269.5	0.276
131.	0.232	270.	0.276
131.5	0.235	270.5	0.278
132.	0.234	271.	0.278
132.5	0.234	271.5	0.277
133.	0.236	272.	0.276
133.5	0.237	272.5	0.278
134.	0.236	273.	0.277
134.5	0.236	273.5	0.277
135.	0.239	274.	0.277
135.5	0.237	274.5	0.276
136.	0.234	275.	0.279
136.5	0.233	275.5	0.28
137.	0.232	276.	0.278
137.5	0.231	276.5	0.279

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
138.	0.229	277.	0.278
138.5	0.232	277.5	0.276
139.	0.234		

SOLUTION

Pumping Test
 Aquifer Model: Confined
 Solution Method: Theis (Recovery)

VISUAL ESTIMATION RESULTSEstimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
T	2.397	ft ² /min
S/S'	4.428E-23	

$$K = T/b = 0.2373 \text{ ft/min (0.1206 cm/sec)}$$

Capture Zone Estimate Work Sheet

Keely (1983) has demonstrated that the capture zone dimensions can be calculated using the following equations:

$$D = Q / 2\pi Vb \quad (1)$$

$$V = (T / b)(1 / n)(dh / dl) \quad (2)$$

$$W = 2\pi D \quad (3)$$

Where:

Q = flow rate (192 cf/day)

b = water bearing unit thickness (10.1 ft)

V = flow velocity (0.288 ft/day)

D = distance to stagnation point (ft)

T = transmissivity (864 sf/day)

dh / dl = hydraulic gradient (0.001 ft/)

n = porosity (dimensionless value of 0.3)

W = width of inflow zone (feet)

The porosity value (sand) was estimated from the literature (Table 2.4 Page 37, Freeze and Cherry, Groundwater, 1979). The hydraulic gradient value was determined using the January 13, 2012 groundwater elevation data. The water bearing unit thickness was determined using the water column within the well screen for RW-13. The flow rate was determined using the water extraction rate during RW-13 constant rate recovery test.